

## Revision of the genus *Sternocoelis* Lewis, 1888 (Coleoptera: Histeridae), with a proposed phylogeny

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**Revision of the genus *Sternocoelis* Lewis, 1888 (Coleoptera: Histeridae), with a proposed phylogeny.** - Twenty six species of *Sternocoelis* Lewis are currently recognized and all occur in the Mediterranean region. *Sternocoelis espadaleri* n. sp. is described from Morocco. The structure of the pronotum, elytra, prosternum and legs were found to be particularly diagnostic. The following new synonyms are proposed: *Sternocoelis ovalis*, 1900 syn. nov. of *S. viaticus* Lewis, 1892; *S. mauritanicus* Lewis, 1888 syn. nov. of *S. fuscus* (Schmidt, 1888); *S. aureopilosus* Escalera, 1921 syn. nov. of *S. fuscus* (Schmidt, 1888); *S. variolosus* Théry, 1921 syn. nov. of *S. alluaudi* Théry, 1921; *S. loustali* Kocher, 1956 syn. nov. of *S. alluaudi* Théry, 1921; *S. politus* (Schmidt, 1888) syn. nov. of *S. bedeli* (Lewis, 1884); *S. cancer* Lewis, 1888 syn. nov. of *S. bedeli* (Lewis, 1884); *S. extructisternum* Lewis, 1888 syn. nov. of *S. bedeli* (Lewis, 1884); *S. pectoralis* Lewis, 1888 syn. nov. of *S. bedeli* (Lewis, 1884); *S. sedilloti* Lewis, 1889 syn. nov. of *S. bedeli* (Lewis, 1884); *S. bonnairei* (Schmidt, 1888) syn. nov. of *S. setulosus* (Reitter, 1872); *S. walkeri* Lewis, 1888 syn. nov. of *S. setulosus* (Reitter, 1872); *S. fulvus* Lewis, 1888 syn. nov. of *S. setulosus* (Reitter, 1872); *S. cancriformis* Escalera, 1921 syn. nov. of *S. slaoui* Théry, 1921.

The lectotypes and paralectotypes of the following taxa are designated: *Hetaerius lewisi* Reitter, 1883, *H. pluristriatus* Fairmaire, 1877, *H. cavisternus* Marseul, 1862, *H. bedeli* Lewis, 1884, *H. politus* Schmidt, 1888, *H. bonnairei* Schmidt, 1888, *H. hispanus* Rosenhauer, 1856, *Haeterius marseulii* Brisout de Barneville, 1866, *Sternocoelis otini* Peyerimhoff, 1949, *S. marginalis* Normand, 1915, *S. laeviodorsis* var. *major* Pic, 1905, *S. laeviodorsis* var. *semiopacus* Normand, 1915, *S. viaticus* Lewis, 1892, *S. vaucheri* Lewis, 1896, *S. aureopilosus* Escalera, 1921, *S. alluaudi* Théry, 1921, *S. cancer* Lewis, 1888, *S. walkeri* Lewis, 1888, *S. fulvus* Lewis, 1888 and *S. cancriformis* Escalera, 1921.

A putative phylogenetic tree is proposed and the zoogeography is also discussed.

**Key-words:** Coleoptera - Histeridae - *Sternocoelis* - Revision - Phylogeny.

## INTRODUCTION

The genus *Sternocoelis* Lewis is a small genus of myrmecophilous histerids distributed in the Mediterranean area (MAZUR, 1984). This genus was established by LEWIS (1888a) to include the species of *Hetaerius* Erichson with a widely and deeply excavated meso- and metasternum. The other genera of Palearctic Hetaeriinae are *Eretmotus* Lacordaire and *Satrapes* Schmidt.

The genus *Sternocoelis* can be readily distinguished from other Palearctic Hetaeriinae by the excavated meso-metasternum. It otherwise resembles the related genus *Hetaerius*.

SCHMIDT (1885c) published a key to the species of *Hetaerius* including several species nowadays included in the genus *Sternocoelis*. Recently (YÉLAMOS, 1993) published a work on the Iberian species of *Sternocoelis*. Historically there have been many species, descriptions of species, systematic changes and new geographical records: LEWIS, 1884, 1887, 1888a, 1889, 1892b, 1894, 1896 and 1900; SCHMIDT; 1885a, 1885b and 1888; PIC, 1905, 1910, 1911 and 1937; FAIRMAIRE, 1876, 1877 and 1883; BICKHARDT, 1913 and 1917; ESCALERA, 1921 and 1929; KOCHER, 1956 and 1958; MARSEUL, 1857 and 1862; MOTSCHULSKY, 1937 and 1858; REITTER, 1872 and 1883; BRISOUT DE BARNEVILLE, 1866; COBOS, 1949; ESPAÑOL, 1970; KRYZHANOVSKIJ & REICHARDT, 1976; LUCAS, 1855; MENOZZI, 1942; NORMAND, 1915; PEYERIMHOFF, 1949; ROSENHAUER, 1856; RAGUSA, 1882; SCHLEICHER, 1930; THÉRY, 1921. Other works on their general biology are: LEWIS, 1888b, 1891 and 1892a; WALKER, 1889. HELAVA *et al.* (1985) published an extensive study on the American Hetaeriinae, including the Nearctic species of *Hetaerius*.

YÉLAMOS (1992) published a revision of the genus *Eretmotus* as a preliminary step before doing it so on the close *Sternocoelis*.

The present work would not have been possible without loans from several Museums. All type series have been studied with the exception of *Sternocoelis loustali* Kocher, 1956, that was not loaned by the Institut Scientifique Chérifien from Rabat, and of *Hetaerius gaudis* Reitter, 1883 and *Sternocoelis sulcaticollis* Pic, 1937 both not found in the European Museums. Therefore, the study of these species is based on their descriptions.

## ABBREVIATIONS

- DEI: Deutsches Entomologisches Institut, Eberswalde, Germany.  
 EEZA: Estación Experimental de Zonas Áridas, Almería, Spain.  
 JM: Josep Muñoz, private collection, Girona, Catalonia, Spain.  
 MHNG: Musée d'Histoire Naturelle, Genève, Switzerland.  
 MNCN: Museo Nacional de Ciencias Naturales, Madrid, Spain.  
 MNHN: Muséum National d'Histoire Naturelle, Paris, France.  
 MNHU: Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.  
 MZ: Museu de Zoologia, Barcelona, Catalonia, Spain.  
 NHML: The Natural History Museum, London, United Kingdom.

NHMW: Naturhistorisches Museum, Wien, Austria.

TM: Termesztudományi Múzeum, Budapest, Hungary.

TY: Tomàs Yélamos, private collection, Barcelona, Catalonia, Spain.

ZM: Zoologisk Museum, København, Danmark.

ZMMLSU: Zoological Museum Moscow Lomonosov State University, Russia.

Subfamily HETAERIINAE Marseul, 1857

*Hétériens* Marseul, 1857. *Ann. Soc. Ent. Fr.*, (3)5: 148.

**Sternocoelis** Lewis, 1888

*Sternocoelis* Lewis, 1888a: 144.

Type species: *Hetaerius acutangulus* Lewis, 1887. Designated by Bickhardt, 1917: 257.

Form globose, oval, convex; setose; length between 1.3-2.8 mm.

Frons with lateral margins carinate, reaching the epistoma; labrum with apical margin truncate; antennal scape strongly enlarged (fig. 24); antennal club cylindrical, lacking annular rings and heavily sclerotized except at truncate apex (photographs 1 and 2).

Pronotum with anterior angles rather broadly, obliquely truncate, elevated; disc convex; anterior angles sometimes expanded, accompanied by a depression near the base of the third elytral stria. Elytra with dorsal striae 1-3 usually present and slightly impressed; stria 4 present only in one species (*S. pluristriatus*); dorsal striae sometimes indicated by rows of setae; external subhumeral stria sinuate, complete, cariniform; marginal stria long, cariniform, usually joined medially with external subhumeral stria (figs. 25 and 26).

Propygidium wide and long in relation to elytra. Pygidium short and convex. Prosternum with keel having very diverse morphology; inner prosternal striae usually strong, convergent or not in front, sometimes evanescent; posterior margin broadly, roundly emarginate, expanded at sides; lobe separated from keel by a variably impressed suture, sometimes by a deep depression; lobe truncate sinuate or divided into two portions. Mesosternum produced in front to fit prosternal emargination; marginal stria fine; lateral foveae usually deep (excretor orifices) situated next to mesocoxae (fig. 27); meso-metasternum deeply excavate; meso-metasternal suture slight. Metasternum with postcoxal and three lateral striae (outer, medial, inner) present (figs. 51-53).

First abdominal sternite with two postcoxal striae.

Legs variably long and expanded.

Male 8th abdominal segment wide and lightly sclerotized; spiculum gastrale Y-shaped; aedeagus with basal piece short; parameres wide and long, distally separated.

## BIOLOGY

Little has been published on the biology of *Sternocoelis*. Larvae and pupae are unknown. LEWIS (1888b) reported some interesting biological observation during

field studies in Spain, Morocco and Algeria. These beetles dwell in clay soils, always within the nests of several ant genera (*Aphaenogaster*, *Cataglyphis*, *Messor* and *Formica*). No species specificity was detected among the ant hosts. However most specimens were found in the nests of several species of *Aphaenogaster*. *Sternocoelis* feeds on larvae and dead adult ants. Within the nest they frequent the ant brood chambers when brood is present. During cool wet weather, both ant's brood and the *Sternocoelis* were found under medium-sized stones (between 20-40 cm). In hot, dry weather, these beetles tend to be found deep within the ant nest.

According to Lewis, ants are unable to grasp *Sternocoelis* with their mandibles due to the hard, smooth nature of their cuticle. Thus, the ants treat these beetles with indifference. Some specimens of *Sternocoelis* were observed clinging to the abdomen of ants with their legs and thus ride on their backs into lower galleries of the nest.

In temperate lowlands *Sternocoelis* is active from winter to the beginning of spring. At higher elevations they appear to be active from midspring up to the beginning summer. Beetle activity was recorded from November up to June, with a few specimens found per ant nest.

#### KEY TO THE SPECIES

- 1 Mesosternum lacking deep lateral foveae near mesocoxae<sup>1</sup>. . . . . 2
- Mesosternum with deep lateral foveae near mesocoxae . . . . . 15
- 2 Sides of pronotum clearly separated from disc by a complete oblique impression, explanate. . . . . 3
- Sides of pronotum not completely separated from disc, usually with short basal and apical impressions. . . . . 7
- 3 Prosternal lobe at lower level than keel, with an abrupt transition between both parts. . . . . 4
- Prosternal lobe situated at slightly lower level, equal to or superior to keel. . . 5
- 4 Pronotum and metasternum coarsely and densely punctate; prosternal keel with inner striae complete (but fine), subparallel, outer striae evanescent (fig. 37); first dorsal striae slightly surpassing middle; elytral epipleurae with two irregular striae; tibiae more expanded (fig. 59). . . . . *S. grandis*
- Pronotum and metasternum finely and sparsely punctate; prosternal keel with inner striae fine, short, medially arcuate, the outer stria distinct (fig. 34); first dorsal striae complete; elytral epipleurae without striae; tibiae less expanded (fig. 57). . . . . *S. otini*
- 5 Prosternal lobe distinctly at weakly superior level of prosternal keel; prosternal keel narrow and long (fig. 35). . . . . *S. marginalis*

<sup>1</sup> Several specimens of *S. fuscus* have incipient lateral foveae in the mesosternum, which are sometimes difficult to see; these specimens might be confused with *S. incisus*, which can be distinguished by the different morphology of prosternum and mesosternum.

- Prosternal lobe distinctly at lower level of keel; prosternal keel wide and short (figs 36 and 38). . . . . 6
- 6 Prosternal lobe not emarginate (fig. 36); prosternal keel strongly rugose and wide, with inner striae evanescent. . . . . *S. laevidorsis*
- Prosternal lobe emarginate (fig. 38), depressed in the middle; prosternal keel only slightly rugose and narrow, with inner striae reaching 2/3 total length. . . . . *S. rugosus*
- 7 Prosternal lobe clearly below level of keel, with a strong demarcation between both parts (fig. 32). . . . . *S. puberulus*
- Prosternal lobe at slightly below, at same level or slightly above level of keel. . . . . 8
- 8 Prosternal lobe deeply emarginate, divided into two parts, separated from keel by a deep depression (fig. 49); sides of pronotum parallel (fig. 22), rounded, without marginal stria; elytra without striae; legs narrow and elongate, not expanded (fig. 67). . . . . *S. comosellus*
- Prosternal lobe variably emarginate, never with a deep emargination or divided, sometimes separated from keel by a slight depression, sides of pronotum not parallel, or rounded, with marginal stria variably impressed; elytra with striae; tibiae usually very expanded, length variable. . 9
- 9 Elytra with the first three dorsal striae complete or slightly abbreviated, the fourth obsolete or reduced on the distal half; three metasternal striae very long, the inner two striae approaching the metacoxae (fig. 52); pronotal disc and median part of elytra strongly convex. . . . . *S. merkliei*
- Elytra usually with complete first dorsal striae, and with a basal remnant of the third stria; three metasternal striae of varying length; pronotal disc and median part of elytra not strongly convex. . . . . 10
- 10 Prosternal lobe deflexed, obliquely oriented in relation to plane of keel (fig. 39); meso-metasternal excavation deep. . . . . *S. fuscus*
- Prosternal lobe either at same level as central part of keel or slightly sloping; meso-metasternal excavation shallow. . . . . 11
- 11 Prosternal lobe at a same level as central part of keel (fig. 28), emarginate, with sides more deflexed than keel; prosternal keel very wide; upper side of body with long aligned setae. . . . . *S. viaticus*
- Prosternal lobe sloping in relation to keel, always at lower level; prosternal keel narrow (fig. 31); upper side of body with setae of diverse morphology. . . . . 12
- 12 Inner prosternal striae fine, indistinct by rugosity, mainly visible distally, not clearly joined anteriorly; upper side of body with short setae, not aligned, markedly and densely punctate; prosternal lobe emarginate; meso-metasternal excavation deep. . . . . 13
- Inner prosternal striae distinct, joined anteriorly; upper side of body with long aligned setae, finely and sparsely punctate; prosternal lobe not emarginate; meso-metasternal excavation shallow. . . . . 14

- 13 Inner prosternal striae not subparallel (fig. 31), approaching, with a short median part of outer striae; prosternal lobe clearly emarginate; inner metasternal stria reaching only 1/3 length of metasternum; epipleurae with a trace of stria. . . . . *S. diversepunctatus*
- Inner prosternal striae subparallel (fig. 30), very distant, without short part of outer striae; prosternal lobe slightly emarginate; inner metasternal stria reaching between 1/2-2/3 length of metasternum; epipleurae without stria. . . . . *S. lewisi*
- 14 Anterior pronotal angles very produced, flattened; pronotum with sparse setigerous pores; elytra weakly broad; meso-metasternal excavation deep; metasternum without distinct part of inner stria; discs of both metasternum and first abdominal sternite punctate. . . . . *S. marseulii*
- Anterior pronotal angles weakly expanded, not flattened; pronotum with dense setigerous pores; elytra very broad; meso-metasternal excavation extremely shallow; metasternum with a short and distinct inner strial remnant; discs of both metasternum and first abdominal sternite smooth. . . . . *S. vaucheri*
- 15 Prosternal lobe deeply emarginate or divided into two parts (fig. 50); sides of pronotum rounded, parallel and lacking marginal stria; legs very long, not expanded (fig. 68). . . . . *S. espadaleri*
- Prosternal lobe bisinuate, not deeply emarginate; sides of pronotum with marginal stria, occasionally straight or parallel; leg morphology variable. . . . . 16
- 16 Prosternal keel and lobe separated by a deep depression (fig. 41); meso- and metatibiae very expanded (fig. 61); inner prosternal striae with a wide medial projection (fig. 41). . . . . 17
- Prosternal keel and lobe not separated by a deep depression, sometimes with a shallow depression or keel and lobe on the same level; meso- and metatibiae variably enlarged; when there is a depression between lobe and keel, then legs very long, not enlarged and lacking medial projections of inner prosternal striae. . . . . 19
- 17 Inner metasternal stria very short; lateral mesosternal foveae broad and deep. . . . . *S. alluaudi*
- Inner metasternal stria very long and reaching metacoxae; lateral mesosternal foveae variable. . . . . 18
- 18 Posterior pronotal angles abruptly produced (fig. 13); sides of pronotum parallel; pronotum very densely punctate, mainly at sides and apical half; body covered with long and dense setae on sides and posterior half; inner prosternal striae with wide and laterally expanded medial projections (fig. 41); protibiae stout and expanded (fig. 61); mesosternal foveae broad and very deep; length 2.2-2.5 mm. . . . . *S. acutangulus*
- Posterior pronotal angles gradually produced (fig. 11); sides of pronotum not parallel; pronotum less densely punctate; body covered by short, broad and dense setae on entire surface; inner prosternal striae

- with fine medial projections extending laterally (fig. 40); protibiae expanded; mesosternal foveae narrow, elongate and shallow; length 1.3-1.7 mm. . . . . *S. incisus*
- 19 Inner prosternal striae with a distinct projection on anterior 2/3; prosternal keel very rugose; medial part of prosternal keel at a same level as the not deflexed poststernal lobe; legs short and very expanded; length of metatibiae less than half total length of body; maximum expansion metatibiae equal to half length of body. . . . . 20
- Inner prosternal striae either straight or sinuate, lacking a distinct anterior projection; prosternal keel either smooth or punctate but not rugose; medial part of prosternal keel not at same level and deflexed; legs long, less expanded; length of metatibiae equal to or more than half total length of body; maximum expansion of metatibiae equal to 1/3 length of body . . . . . 22
- 20 Elytra with an arcuate basal part of fourth dorsal stria; posterior pronotal angles not produced (fig. 14). . . . . *S. pluristriatus*
- Elytra without a trace of fourth dorsal striae; posterior pronotal angles variably produced (figs. 15 and 16). . . . . 21
- 21 Pronotum, elytra, propygidium and pygidium covered with long, yellow recumbent setae; disc of pronotum and elytra with setigerous pores and sparse, fine punctures, slightly more dense on elytra; elytra subparallel, slightly enlarged at shoulders; disc of metasternum with a variably deep impression on both sides. . . . . *S. punctulatus*
- Pronotum, elytra, propygidium and pygidium covered with erect yellow setae of median length (in some specimens there are only erected setae on sides, because the other lie down); upper side of body with large punctures of variable density, always with setigerous pores; elytra strongly enlarged, not subparallel; metasternal disc without lateral impressions. . . . . *S. bedeli*
- 22 Prosternal lobe either at same level as keel or separated by a shallow depression (fig. 45); metasternum with inner stria well impressed and nearly reaching metacoxae; mesotibiae strongly expanded medially; metatibiae long (length of metatibiae/total length body = 0.46-0.52), with medial triangular expansion (maximum width between 1/3-1/4 of tibial length), basal half narrower than distal half; body covered with long, erect setae as well as additional microsetae. . . . . *S. setulosus*
- Prosternal lobe clearly more prominent than keel or separated from keel by a distinct impression; metasternum with both inner striae less impressed and not reaching metacoxae; mesotibiae gradually expanded in distal half; metatibiae longer (length of metatibia/total length body = 0.58-0.75) and slender, not triangular (maximum width clearly lower than 1/3 length); pubescence variable. . . . . 23
- 23 Inner prosternal striae obsolete, at same level as outer ones; prosternal lobe and keel without a depression between them (fig. 44); meso- and

- metatibiae slightly expanded medially (fig. 62); upper side body surface with mixture of very long and very short setae. . . . . *S. atlantis*
- Inner prosternal striae distinct and elevated above outer ones; prosternal lobe and keel with a depression between them (figs. 46-48); meso- and metatibiae sometimes medially expanded; upper side of body always with long setae and sometimes with short ones as well. . . . . 24
- 24 Meso- and metatibiae clearly expanded medially (fig. 64 and photograph 3); body covered with setae of different length, the shorter ones relatively long and dense; inner prosternal striae slightly sinuate (fig. 46); prosternal keel almost flat longitudinally; meso-metasternal excavation shallow. . . . . *S. hispanus*
- Meso- and metatibiae without a clear medial expansion (figs. 65 and 66); body sometimes covered by setae of different length but without dense microsetae; inner prosternal striae not sinuate (figs. 47 and 48); prosternal keel convex; meso-metasternal excavation very deep. . . . . 25
- 25 Pronotal sides not parallel and not bisinuate (fig. 21); posterior angles of pronotum not clearly produced; pronotum regularly covered with setigerous granules; pronotum and elytra covered with setae of different length; metatibiae shorter (fig. 66) (length of metatibiae/total length body = 0.63-0.65). . . . . *S. slaoui*
- Pronotal sides subparallel, bisinuate (fig. 20); posterior angles of pronotum clearly produced; pronotum with setigerous punctures on anterior third; pronotum and elytra with very long setae; metatibiae very long (fig. 65) (length of metatibiae/total length body = 0.73-0.75). . . . . *S. arachnoides*

***Sternocoelis viaticus* Lewis, 1892**

(Figs 1, 28 and 70)

*Sternocoelis viaticus* Lewis, 1892b: 263.

*Sternocoelis ovalis* Lewis, 1900: 252 (nov. syn.).

RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex; covered with long, aligned, yellow setae.

Frons rugose, setose; frontal stria cariniform, evanescent on epistoma; labrum weakly convex, bisinuate; mandibles robust and convex, densely punctate; antennal scape very much enlarged, rugose, bearing short setae.

Pronotum convex, subtrapezoidal (fig. 1); anterior angles obliquely truncate, slightly elevated; posterior angles slightly produced; marginal stria complete; depression opposite to base first dorsal stria; surface with setigerous punctures, larger and denser on sides and base, mixed with other non setigerous punctures. Elytra weakly convex, with large setigerous punctures and puncticulate; two first dorsal striae complete, third reaching to anterior half; striae with rows of long setae; outer



subhumeral stria complete; marginal stria reaching the outer subhumeral stria on distal 2/3; epipleurae rugose, with an irregular stria.

Propygidium with coarse and dense setigerous punctures. Pygidium with smaller and sparser setigerous punctures.

Prosternal lobe and keel nearly at same level in lateral aspect, with shallow depression between them, rugose, with microsetae; prosternal keel wide; inner prosternal striae slightly divergent, not reaching lobe (fig. 28); outer prosternal striae well impressed. Meso-metasternal excavation shallow; mesosternum without lateral foveae, only with oblique elongate impressions. Metasternum with disc furnished with sparse microscopic punctures; sides fossulate; both outer lateral striae very oblique, approaching, inner one indistinct.

First abdominal sternite finely punctulate.

Legs expanded, with short setae; meso- and metatibiae triangular.

Aedeagus as figure 70.

Length 1.5 mm. Width 1.3 mm.

#### Type material

Two specimens of the type series of *Sternocoelis viaticus* Lewis [in NHML] have been studied. The lectotype and one paralectotype are now designated. LECTOTYPE labelled: */Sternocoelis viaticus* Lewis Type/, /Teniet Had 1.5.92/, /Type/, /G. Lewis Coll. B.M. 1926-369/. Paralectotype labelled: */Sternocoelis viaticus* Lewis Co-Type/, /Meskoutin G. Lewis 22.4.92/, /Co-Type/ and with the same last label.

The holotype of *Sternocoelis ovalis* Lewis has been examined, labelled as follows: */Sternocoelis ovalis* Lewis Type/, /Yakouren/, /Type/, /G. Lewis Coll. B.M. 1926-369/ [in NHML].

#### Other material examined

One specimen of the MHNG labelled as follows: /Algérie: Gde Kabylie, Azazga-Yakouren 600 m 14.V.1988 Besuchet Löbl Burk./, */Sternocoelis* sp. 3 det. S. Mazur/.

Thirteen specimens of the MNHN (accompanied by ants) with the following labels: (1) /A. Théry 1907 L'Edough/, /not *viaticus* ?*punctulatus* Lucas/, /Muséum Paris ex Coll. P. de Peyerimhoff/; (2 and 3) /Mt. Edough Juin 1900 Dr. A. Chobaut/, */Sternocoelis viaticus*/, /Coll. Dr. V. Auzat c.v./, */Sternocoelis viaticus* Lewis/; (4) /Edough 5-94/, */S. viaticus*/; (5 and 6) /Mahoumar 1400 m L. Clouet des Pesrouches à Medjez-Amar Algérie/; (7, 8, 9 and 10) /Bugeaud L. Clouet des Pesrouches à Medjez-Amar Algérie/; (11) /A. Théry 30-1900 Edough/, /not *viaticus* ?*punctulatus* Lucas/; (12) /Région du Mont Ouarsenis, de Vauloger/; (13) /Sgag Aurés 1750 m 11 avril 1918/.

One specimen of the MNHU (accompanied by an ant): /Edough 5-94/, /Comp. par l'auteur au Type/, */Sternocoelis viaticus* Lewis/, /Zool. Mus. Berlin/.

Two specimens of the NHML labelled: (1) /Blida 10.5.94/, /G. Lewis Coll. B.M. 1926-369/; (2) /Province d'Oran Loc. ?/ and the same last label (this specimen was in the type series of *Sternocoelis pectoralis*).

One specimen in the TY: /Yakouren Chobaut/, */viaticus*/.

#### Distribution

This species is known from the north of Algeria.

#### Ecology

The species is active in spring and occurs in mountainous areas. It inhabits the nests of *Aphaenogaster gibbosa* ssp. *mauritanica* Emery.

**Sternocoelis marseulii** (Brisout de Barneville, 1866) (Figs 2, 29, 54, 71 and 84)

*Haeterius marseulii* Brisout de Barneville, 1866: 367.

*Sternocoelis marseulii* (Brisout de Barneville): Lewis, 1888a: 153.

*Sternocoelis durforti* Español, 1970: 93-95 (synonymized by Yélamos, 1993: 152).

## RE-DESCRIPTION

Color reddish brown, shiny; body weakly convex, broadly oval; covered with long yellow setae.

Frons with setigerous pores; frontal stria cariniform, irregular, longitudinally crossing epistoma; labrum with medial depression, bisinuate in front; mandibles large, convex; antennal scape very enlarged, with short setae.

Pronotum trapezoidal (fig. 2), with fine and sparse setigerous pores and long yellow setae; anterior angles weakly produced, rounded; posterior angles slightly produced; base of prosternum with shallow impression opposite to base first dorsal stria; marginal stria complete. Elytra moderately convex; doubly punctate, punctures irregular and sparse, with long erect setae along striae; first dorsal stria complete, second reduced apically and third interrupted at middle; outer subhumeral stria joined to marginal stria at middle; epipleurae smooth, bistriate, joined together and also with marginal stria.

Propygidium convex, with dense setigerous pores and setae. Pygidium convex, finely punctulate.

Prosternum with keel at higher level than lobe (fig. 29); lobe very rugose, not prominent; inner prosternal striae strong, joined in front, interspace coarsely and densely punctate; sides keel very rugose; outer striae obsolete. Meso-metasternal excavation shallow; mesosternum without lateral foveae, but with fine oblique impressions. Metasternum finely punctulate on disc; without inner lateral stria, medial stria strong, very arcuate, reaching metacoxae, and outer stria fine and short; sides fossulate.

First abdominal sternite convex, finely punctulate on disc, with coarse punctures on sides.

Legs short, expanded (fig. 54); meso- and metatibiae triangular, punctate and setose.

Aedeagus as figure 71 and spiculum gastrale as figure 84.

Length 1.3-1.4 mm. Width 1.1-1.2 mm.

## Type material

Seven specimens of the type series of *Haeterius marseulii* Brisout de Barneville have been examined. The lectotype and five paralectotypes are now designated. LECTOTYPE [in MNHN] labelled: /Type/, /Marseulii Ch. Bris./, PARALECTOTYPES, three specimens of the same Museum and with identical labels. One specimen of the MNHN labelled: /Escorial (Espagne)/, /Type/, /Marseulii Bris., Coll. Théry, S. Théry/. The other two specimens of the MNHU are labelled as follows: (1) /Type/, /Marseulli. Bris. typ. Escorial/. /coll. J. Schmidt/, /Marseulii Bris./, /Zool. Mus. Berlin/; (2) /Escorial, Brisout/, /Type/, /Zool. Mus. Berlin/, /Marseulii/.

The holotype and six paratypes of *Sternocoelis durforti* Español have been studied [holotype and five paratypes in MZ and one paratype in MNHN]. Holotype, labelled: /Pla dels Motllats. Montral 25-V-69. F. Español leg./, /Sternocoelis durforti n. sp., F. Español det./,

/Tipo/. Paratypes, three specimens with same labels as the holotype, except the paratype label. One specimen labelled: /Farena, 24-V-69, F. Español leg./, /*Sternocoelis durforti* n. sp., F. Español det./, /Paratipo/. One specimen with the same second and third labels, as well as the first one /Pinetell, 22-VI-69, F. Español leg./, One specimen [in MNHN] labelled /Farena, Prades, 22-VI-69, F. Español leg./, /Nido *Aphaenogaster*, F. Español leg./, /Paratypus/, /*Sternocoelis durforti*, F. Español det./.

#### Other material examined

One specimen of the DEI: /*Hetaerins Marseuli* Bris., S. Cordoba, Ehlers/, /Coll. L.v. Heyden, DEI Eberswalde/.

Two specimens of the MNCN: /Escorial, 20.V.1926/, /*Sternocoelis marseulii*/.

Five specimens of the MNHN/ (1) /Escorial, Lewis apr. 98/, /Coll. Bonnaire/, /*Marseuli* Brisout/, /Coll. Dr. V. Auzat/, /*Sternocoelis Marseuli*, Brisout/; (2) /Huescar, 20.5.900/, /Espagne, ex. Escalera/, /comparé au Type, 18.VI.1923, Dr. Auzat/, /Coll. Dr. V. Auzat/, /*Sternocoelis marseuli*, Brisout/; (3) /Escorial, 30-V-1926, Escalera/, /Coll. Dr. V. Auzat/, /*Sternocoelis marseuli*, Brisout/; (4 and 5) /Escorial, 14-V-1926, Escalera/, /Coll. Dr. V. Auzat/, /*Sternocoelis marseuli*, Brisout/.

Eleven specimens of the MZ. Two specimens /Pla dels Motllats, Mont-ral, 25-V-69, F. Español leg./, Four specimens /Farena, Serra de Prades, 24-V-69, F. Español leg./, Two specimens /El Pinetell, Serra de Prades, 22-VI-69, F. Español leg./, Three specimens /El Pinetell, Serra de Prades, 31-V-71, F. Español leg./, One specimen /Plana d'Ancosa, La Llacuna, 1.VIII.71, *Aphaenogaster* sp./.

One specimen in TY labelled: /El Pinetell, 13.6.82, F. Español leg./.

#### Distribution

This species mainly occurs in the mountains of central and north-eastern Spain (Sierra del Guadarrama, Serra de Prades and Serra de la Mussara). It is also known from a few localities from the south of Spain (Sierra de Córdoba and Huéscar, Granada).

#### Ecology

This species is active mainly in May and June in mountainous areas. They inhabit nests of several species of *Aphaenogaster*.

***Sternocoelis vaucheri* Lewis, 1896**

(Figs 51 and 72)

*Sternocoelis vaucheri* Lewis, 1896: 62.

#### RE-DESCRIPTION

Colour light brown, shiny; body strongly convex; covered with long yellow setae.

Frons rugose, with short setae; frontal stria cariniform, evanescent on episoma; labrum flat und truncate; mandibles large, convex, punctulate; antennal scape strongly enlarged, rugose.

Pronotum subtrapezoidal, convex; anterior angles rounded, weakly produced; posterior angles produced; marginal stria fine, complete; surface uniformly impressed with setigerous punctures, coarser and denser on sides, and apical half with long

setae; small basal depression opposite to base second dorsal stria. Elytra very wide and convex, with mixture of fine, dense punctures, and several setigerous punctures; first dorsal stria complete, second and third reaching middle of elytra; inner subhumeral stria complete, and marginal one joined medially with outer subhumeral stria; epipleurae with a well impressed, irregular, and abbreviated stria.

Propygidium with coarse and dense punctures. Pygidium sparsely punctate.

Prosternum with keel at a more prominent level than lobe; lobe very reduced; inner prosternal striae well impressed, joined in front; prosternal keel flat, sparsely punctate; prosternal keel sides and lobe rugose; outer prosternal stria very faint. Meso-metasternal stria shallow; mesosternum without deep foveae, only with an oblique elongate impression. Disc of metasternum smooth and convex; inner lateral stria fine, not reaching middle, medial strong, complete and oblique, the outer stria obsolete (fig. 51).

First abdominal sternite convex and smooth.

Legs short, with meso- and metatibiae weakly expanded, punctate and setose.

Aedeagus as figure 72.

Length 1.3-1.4 mm. Width 1.0-1.1 mm.

#### Type material

Two specimens of the type series have been studied [both in the NHML]. The lectotype and one paralectotype are now designated. LECTOTYPE ♂ labelled: */Sternocoelis vaucheri* Lewis, *Type*, /2.96, Tangier/, */Type*/, /G. Lewis Coll., B.M. 1926-369/. PARALECTOTYPE ♂ labelled: */Tanger 1896, Vaucher*/, /much more convex than *Marseuli* Bris./, /G. Lewis Coll., B.M. 1926-369/ (accompanied by an ant).

#### Other material examined

There are two specimens in MNHN labelled as follows: (1) */Tanger*/, */Vaucheri*., Lewis, *Tanger*/. (2) */1897, Tanger*/. /Maroc, ex Musaeo, H. Vaucher, 1908/, */Sternocoelis Vaucheri* Lew./.

#### Distribution

This species is known from Tangier (north of Morocco).

#### Ecology

The beetle is apparently active only in January and February at low elevations. It occurs in the nests of *Aphaenogaster sardoa* Mayr, *A. strioloides* Forel and *A. crocea* André.

#### *Sternocoelis lewisi* (Reitter, 1883)

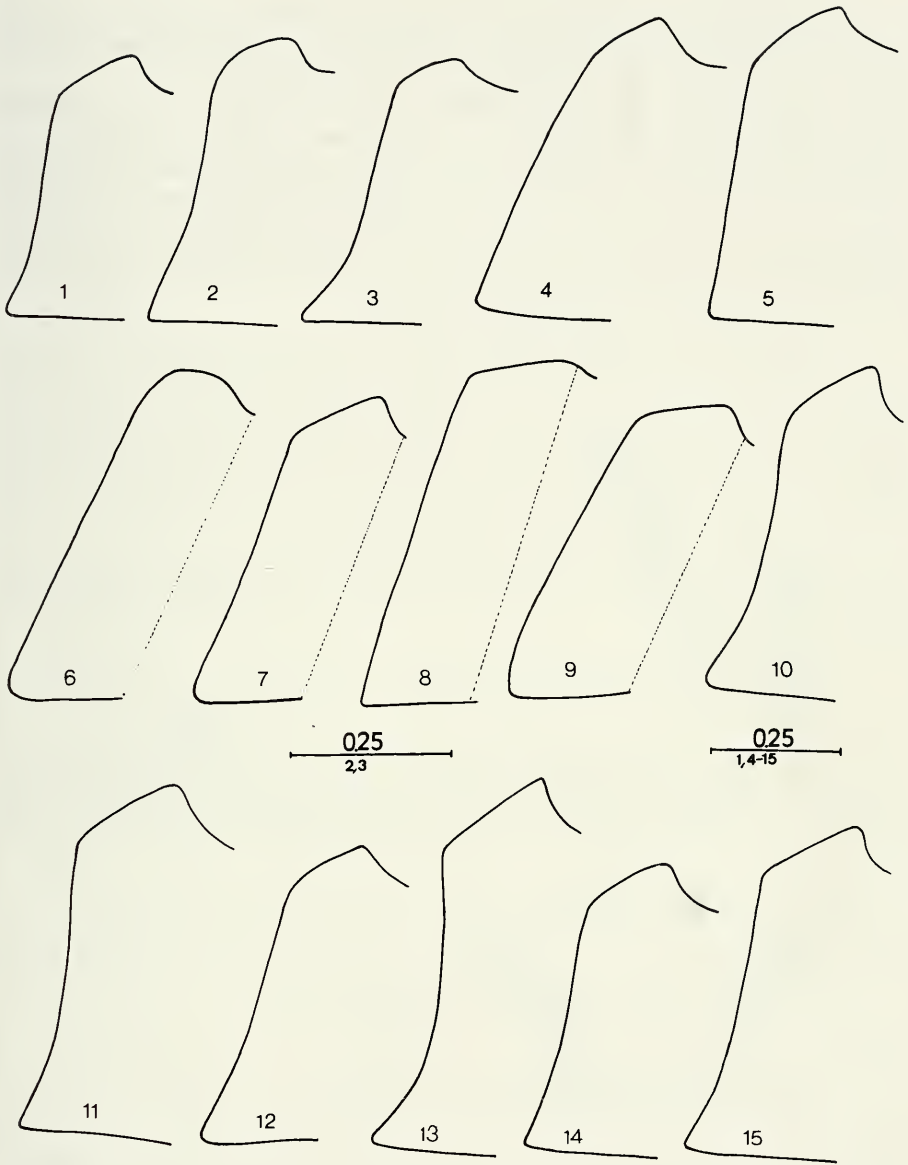
(Figs 3 and 30)

*Hetaerius lewisi* Reitter, 1883: 143.

*Sternocoelis lewisi* (Reitter): Lewis, 1888a: 150.

#### RE-DESCRIPTION

Colour dark brown, shiny; body strongly convex; surface covered with mid-length yellow setae.



FIGS 1-15

Left margin of pronotum: *Sternocoelis viaticus* Lewis (1); *S. marseullii* (Brisout de Barneville) (2); *S. lewisi* (Reitter) (3); *S. puberulus* (Motschulsky) (4); *S. merklüi* (Schmidt) (5); *S. otini* Peyerimhoff (6); *S. marginalis* Normand (7); *S. grandis* (Reitter) (8); *S. robustus* (Pic) (9); *S. fuscus* (Schmidt) (10); *S. incisus* (Schmidt) (11); *S. allnaudi* Théry (12); *S. acutangulus* (Lewis) (13); *S. pluristriatus* (Fairmaire) (14); *S. bedeli* (Lewis) (15). Scale in mm.

Frons rugose, with dense setigerous pores; frontal stria cariniform, regular, evanescent on epistoma; labrum large, weakly depressed and bisinuate; mandibles large, convex, with short setae; antennal scape very enlarged, setose.

Pronotum subtrapezoidal, gradually enlarged posteriorly (fig. 3); anterior angles slightly produced, neither elevated nor truncate; surface covered with dense and coarse punctures; with a deep depression near to base first dorsal stria; marginal stria complete. Elytra strongly convex, humeral angles rather enlarged, covered with dense, deep punctures; marginal stria joined with outer subhumeral stria at apical 2/3 of elytra; first dorsal stria complete, second stria exceeding 2/3 elytral length and third reaching middle; epipleurae rugose, without striae.

Pygidium and pygidium sparsely punctate.

Prosternal lobe rugose, not prominent, at a lower level than keel (fig. 30); prosternal keel with distinct outer striae; inner prosternal striae well impressed and parallel; keel narrowed in front, rugose, without striae. Meso-metasternal excavation very deep; mesosternum without lateral foveae. Metasternum finely and densely punctate on disc; inner lateral stria reaching middle or 2/3; other two striae more lateral, not reaching metacoxae; sides with coarse and irregular punctures.

First abdominal sternite finely and densely punctate.

Legs of normal length, meso- and metatibiae very expanded triangular and setose.

Male not known.

Length 1.8-2.1 mm. Width 1.6-1.8 mm.

#### Type material

Two specimens of the type series have been examined. The lectotype and one paralectotype are now designated [both in MNHU]. LECTOTYPE ♀ labelled: */Hetaerius Lewisi* m.n. sp./, */Morea Cumani Brenske/*, */Zool. Mus. Berlin/*. PARALECTOTYPE ♀ labelled: */Type/*, */Lewisi* Rtt. typ./, */Morea Hagios Wlassis Brenske/*, */coll. J. Schmidt/*, */Zool. Mus. Berlin/*, */Lewisi* Reitt./.

#### Other material examined

Two specimens of the MNHU with the labels: */Missolunghi/*, */Zool. Mus. Berlin/*.

#### Distribution

This species is known from several localities in Greece.

#### Ecology

No biological data are available for this species.

#### ***Sternocoelis diversepunctatus* Pic, 1911**

(Fig. 31)

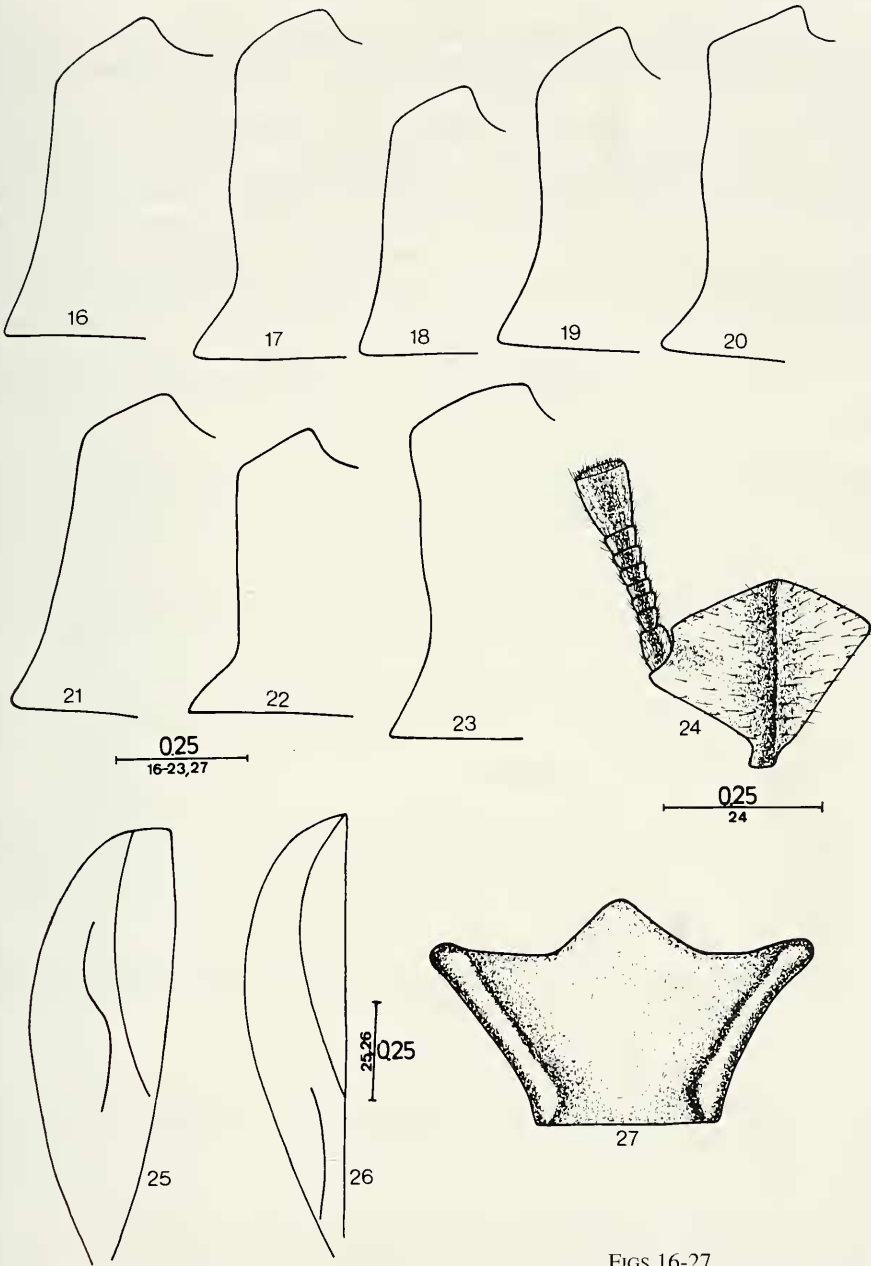
*Sternoscaelis diversepunctatus* Pic, 1911: 137 (error).

*Sternocoelis diversepunctatus* Pic: Bickhardt, 1917: 157.

*Sternocoelis diversipunctatus* Pic: Menozzi, 1942: 7 (error).

#### RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex, oval; body covered with short yellow setae.



FIGS 16-27

Left margin of pronotum: *Sternocoelis punctulatus* (Lucas) (16); *S. atlantis* Théry (17); *S. setulosus* (Reitter) (18); *S. hispanus* (Rosenhauer) (19); *S. arachnoides* (Fairmaire) (20); *S. slaoui* Théry (21); *S. comosellus* (Fairmaire) (22); *S. espadaleri* n. sp. (23). Left antenna in ventral view of *S. alluandi* Théry (24). Left epipleura: *S. puberulus* (Motschulsky) (25); *S. robustus* (Pic) (26). Disc of mesosternum of *S. arachnoides* (Fairmaire) (27). Scale in mm.

Frons with dense setigerous punctures; frontal stria cariniform; labrum bisinuate; mandibles large, convex, finely punctulate; antennal scape very enlarged, rugose and setose.

Pronotum subtrapezoidal; disc convex; anterior angles truncate, weakly produced; posterior angles slightly produced; marginal stria complete; surface coarsely and densely punctate, mainly laterad, punctures are setigerous variety; setae also present laterad; base pronotum with deep depression. Elytra weakly convex; first dorsal stria well impressed and complete, second not reaching apex and third only reaching middle; marginal stria joined with outer subhumeral stria apically; surface with dense and well impressed punctures, sides with several setigerous punctures and setae; epipleurae rugose, with irregular medial part of stria.

Propygidium and pygidium convex, with rather dense well impressed punctures.

Prosternal lobe rugose, at lower level than keel and clearly bisinuate (fig. 31); prosternal keel rugose and narrow; inner prosternal striae obsolete, not parallel and approaching, with short medial remnants of outer striae. Mesosternum finely punctate; meso-metasternal depression not deep; meso-metasternum with well impressed punctures and without lateral foveae. Metasternum with fine inner lateral stria, only on anterior third; medial stria almost reaching metacoxae; outer stria shorter; sides fossulate.

First abdominal sternite finely and densely punctate.

Legs very expanded and setose; meso- and metatibiae triangular.

Male not known.

Length 2.0 mm. Width 1.9 mm.

#### Type material

It has been possible only to examine the holotype ♀ deposited in the Pic's collection deposited in the MNHN with the label /Type *Sternocoelis diversepunctatus* Pic/ (accompanied with two ants).

#### Distribution

Described from Cyprus and subsequently recorded from Rodi Island (Aegean Sea, Italy) (MENOZZI, 1942).

#### Ecology

This species was observed in April in nests of *Aphaenogaster balcanica* Emery.

#### **Sternocoelis puberulus** (Motschulsky, 1858)

(Figs 4, 25, 32 and 73)

*Hetaerius puberulus* Motschulsky, 1858: 188.

*Eretmotes palumboi* Ragusa, 1882: 7 (synonymized by Lewis, 1888a: 150).

*Sternocoelis puberulus* (Motschulsky); Lewis, 1888a: 150.

#### RE-DESCRIPTION

Colour reddish brown, shiny; body form very convex, oval; surface covered with long yellow setae.



Frons coarsely and densely punctate; frontal stria cariniform, regular, evanescent on epistoma; labrum slightly depressed and bisinuate; mandibles large, convex, with short setae; antennal scape very enlarged, setose.

Pronotum subtrapezoidal, convex, very enlarged posteriorly (fig. 4); anterior angles slightly elevated, not truncate; posterior angles weakly produced; marginal stria interrupted apically; surface with mixture of large, irregular, dense setigerous pores, and some smaller punctures; pronotum base with deep depression opposite to base of second dorsal stria. Elytra convex, very enlarged, with well impressed, dense punctures, without setigerous pores; marginal stria very strong but short, joined with outer subhumeral stria at middle, complete; first dorsal stria complete, second surpassing middle, less impressed, third dorsal stria finely impressed, as a short basal trait; epipleurae rugose, with short irregular stria (fig. 25).

Propygidium and pygidium with coarse, regular and dense punctures, without setigerous pores.

Prosternal lobe emarginate, at a lower level than keel (fig. 32); outer prosternal stria indistinct by rugosity of keel and lobe; inner prosternal striae parallel, only distinct up to middle, with a depressed and densely punctate area between them. Meso-metasternal excavation shallow; mesosternum without lateral foveae near to mesocoxae; inner metasternal lateral stria only reaching middle, medial one cariniform and reaching metacoxae, and outer stria very short, approaching the medial stria; sides of metasternum with short setae and with coarse irregular, dense punctures.

First abdominal sternite finely punctate.

Legs setose, rather expanded, meso- and metatibiae triangular.

Aedeagus as figure 73.

Length: 1.5-1.8 mm. Width 1.4-1.7 mm.

#### Type material

The holotype of *Hetaerius puberulus* has been studied, labelled as follows: /*Sicilia*/, /*Haeterius puberulus* Motsch. *Sicilia*/, deposited in ZMMLSU.

Two specimens have been studied apparently from the type series of *Eretmotus palumboi* Ragusa. A holotype has not been designated. They are not designated here as lectotype and paralectotype because I doubt that they really belong to the type material.

#### Other material examined

Four specimens have been studied of the DEI and labelled as follows: (1) /*Sicilia*/, /Coll. Kraatz/, /Bickhardt det./, /*Hetaerius puberulus*/; (2) /*Sicilia* 1906 Ficuzza O. Leonhard/, /*Sternocoelis puberulus* Motsch. A. Reichardt det./; (3) /*Sicilia*/, /Coll. Stierlin/, /*H. puberulus* Motsch./; (4) /*Eretmotes Palumboi* Rag. Sicil. Ragusa 15 fres./, /Coll. L.v. Heyden DEI Eberswalde/.

Three specimens of the MNHN labelled as follows: (1) /*cavisternus*/, /136/, /Muséum Paris coll. de Marseul 1980/; (2) /*Sicilien* Ragusa/, /Muséum Paris 1933 Coll. Desbordes/, /*puberulus* Coll. Bickhardt/; (3) /*Sicilia*/, /Coll. Bonnaire/, /*Hetaerius puberulus* Mtsch. Er. Palumboi Rag./, /Coll. Dr. V. Auzat/, /*Sternocoelis puberulus* Mots./.

Four specimens of the MNHU, two were labelled /*Sicile Baudi*/, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, /*puberulus* Motsch./, /Zool. Mus. Berlin/. One specimen /*Sicilia* Ficuzza 84 E. Ragusa/, /Zool. Mus. Berlin/. One specimen labelled /*Eretmotes Palumboi* Ragusa typ. Sicilien/, /Zool. Mus. Berlin/.

Two specimens of the ZM, both labelled /Messina Schiödde/.

Two specimens of the TM labelled: (1) /Sicilia/, /*puberulus* Sicilia Baudi/, /*Sternoc. puberulus* Motsch. Coll. Reitter/; (2) /Sicilia Ragusa/, /Coll. Reitter/, /Paratypus *Eretmotes Palumboi* Ragusa/.

### Distribution

This species is known from several localities in Sicily, and also recorded from Corsica and Sardinia (VIENNA, 1980).

### Ecology

It inhabits mountainous areas, and is active in spring. It has been recorded from nests of *Formica fusca* Linnaeus.

***Sternocoelis merklia*** (Schmidt, 1885)

(Figs 5, 33, 52 and 74)

*Hetaerius merklia* Schmidt, 1885a: 238.

*Sternocoelis merklia* (Schmidt): Lewis, 1888a: 154.

### RE-DESCRIPTION

Colour reddish brown, shiny; body very convex, oval; with few, yellow, mid-length setae only (in some specimens setae are more dense).

Frons slightly rugose and with setigerous punctures; frontal stria cariniform, evanescent on epistoma; labrum weakly depressed, bisinuate; mandibles large, convex, without setae; antennal scape punctate, very enlarged, with short setae.

Pronotum with anterior angles produced (fig. 5), somewhat elevated; posterior angles not produced; sides not parallel; pronotal surface with dense setigerous punctures, larger on sides and base, smaller apically; disc smooth, longitudinally convex; marginal stria complete; small basal depression opposite first dorsal stria. Elytra sparsely and finely punctate; medial sutural zone very convex longitudinally, like pronotum; marginal stria joining outer subhumeral stria on 2/3; first, second and third dorsal striae complete, fourth as a short trait, arcuate toward suture, sometimes obsolete; epipleurae rugose, with a short irregular stria.

Propygidium and pygidium coarsely and densely punctate, setose.

Prosternal lobe rugose and bisinuate; prosternal lobe and keel at a same level (fig. 33); lobe not prominent; keel rugose; inner prosternal striae parallel up to 2/3 elytral length, thence converging at apical end; outer prosternal striae well impressed. Meso-metasternal excavation shallow; mesosternum without lateral foveae. Metasternal disc finely and densely punctate; sides fossulate; both inner striae reaching metacoxae, outer striae shorter (fig. 52).

First abdominal sternite finely and sparsely punctate.

Legs of normal length, with short setae; meso- and metatibiae triangular.

Aedeagus as in figure 74.

Length 1.8-2.0 mm. Width 1.6-1.8 mm.

### Type material

The holotype (♀) has been studied [in MNHU]: /Type/, /*Merklii* Schmidt, typ. Constantinop./, /Turkei Constantinopol M./, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, /*Merklii* Schmidt/.

### Other material examined

One specimen of the DEI (accompanied by an ant) labelled /Bulgar Rumel Backovo 11.V.09 Rambousek/, /*Messor barbarus stuctor* Latr. var. *mistica* Nyl./, /*Hetaerius merkli* det. J. Müller/, /coll. Leonhard/.

One specimen of the MHNG, with the first label like the former, moreover /*Sternocoelis Merkli* Schmidt H. Desbordes det. 22/.

Three specimens of the MNHN, two specimens also with the same first label, moreover /Coll. Dr. V. Auzat/. One specimen labelled: /Paxos S. Corfu: (Kerkira): 2 km NW Galos 17.4.81 Scheuern leg./, /Muséum Paris Coll. J. Théron d./, /Olivenhain/.

One specimen of the NHMW labelled: /*Lewisii* Reitt. Bittner Graecia/, /Isthmus/.

### Distribution

This species is only known from a few localities in Greece (Kerkira, Corfu), Bulgaria (Rumel, Backovo) and Turkey (Istanbul).

### Ecology

It occurs at lower altitudes and is active in spring. It inhabits the nests of *Messor structor* (Latreille).

***Sternocoelis otini*** Peyerimhoff, 1949

(Figs 6, 34 and 57)

*Sternocoelis otini* Peyerimhoff, 1949: 264.

### RE-DESCRIPTION

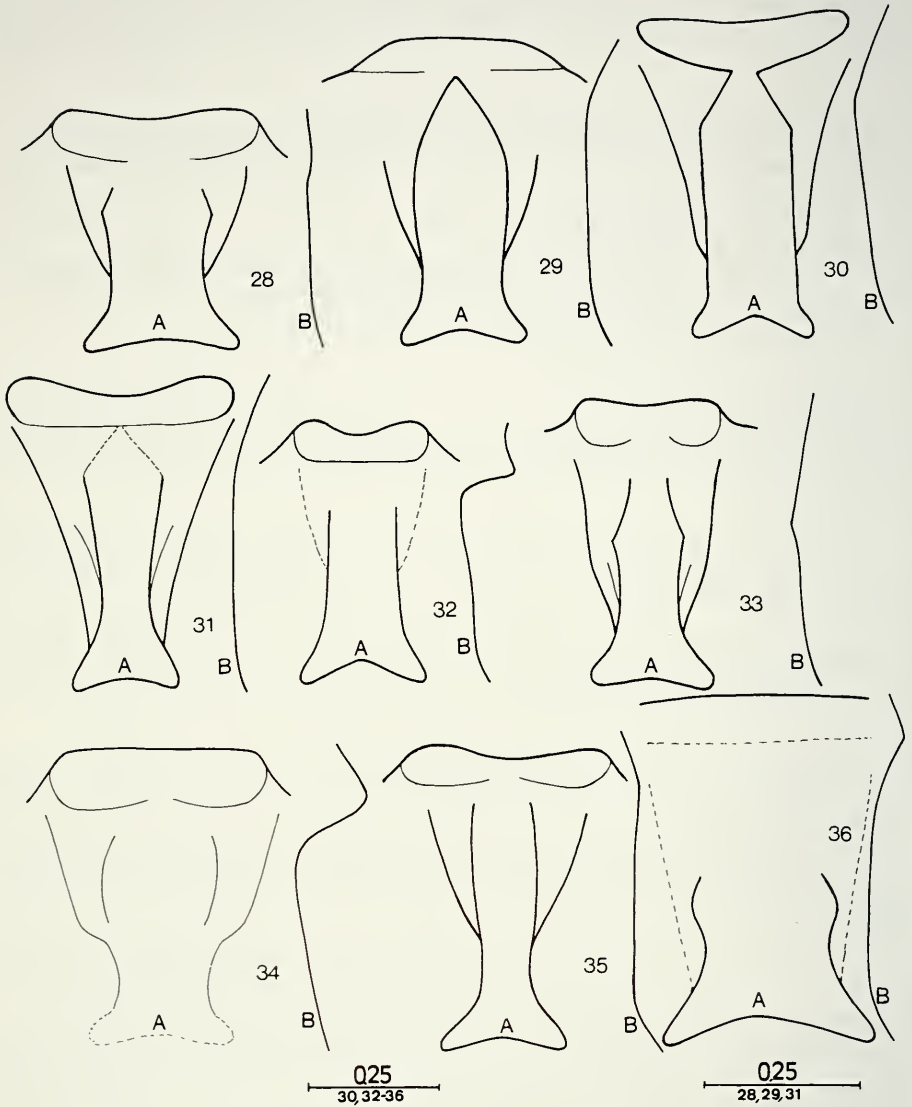
Colour reddish brown, shiny; body form weakly convex, oval; surface covered with short yellow setae.

Frons finely punctulate; frontal stria cariniform, faint; labrum slightly depressed; mandibles large and convex; antennal scape very enlarged, finely rugose and setose.

Pronotum subtrapezoidal, rather convex with sides clearly separated, explanate (fig. 6); anterior angles neither produced nor elevated; posterior angles not produced; marginal stria very fine or obsolete; surface sparsely punctate; base of pronotum with a clear depression. Elytra weakly convex, wide, finely punctulate; first dorsal stria complete, second and third reaching middle; marginal stria joined to outer subhumeral; epipleurae slightly rugose, without striae.

Propygidium and pygidium with setigerous pores and fine short setae.

Prosternal lobe prominent, at lower level than keel and separated by a depression (fig. 34); prosternal keel wide, very rugose, with only a medial short part of inner prosternal stria; outer prosternal stria distinct. Meso-metasternal excavation very deep, mesosternum in a right angle with keel in lateral view, without lateral foveae. Metasternum finely punctulate; inner stria reaching metacoxae, other two striae long and oblique; sides fossulate.



FIGS 28-36

Prosternal lobe and keel, ventral view (A), outline (B): *Sternocoelis viaticus* Lewis (28); *S. marsulii* (Brisout de Barneville) (29); *S. lewisi* (Reitter) (30); *S. diversepunctatus* Pic (31); *S. puberulus* (Motschulsky) (32); *S. merklüi* (Schmidt) (33); *S. otini* Peyerimhoff (34); *S. marginalis* Normand (35); *S. laevidorsis* (Fairmaire) (36). Scale in mm.

First abdominal sternite finely punctulate.

Legs long and slender; tibiae regularly expanded on apical half (fig. 57), not triangular

Male unavailable.

Length 2.4 mm. Width 2.2 mm.

#### Type material

Although the original description was based on two specimens presently only a single specimen remains. The only examined specimen (accompanied by an ant) has been designated LECTOTYPE, and is labelled: ♀ /Dayet Ifrah, 27-6-43, Otin/, /*Sternocoelis otini* Type/, /*Cataglyphis viatica* subs. *mauritanica* Emery/, /Moyen Atlas, alt. 1600 m/, [in MNHN].

#### Distribution

This species is only known from the type locality near Ifrane (Moyen-Atlas, Morocco).

#### Ecology

This species occurs in a mountainous area. It has been collected at the end of June in a nest of *Cataglyphis mauritanicus* Emery.

***Sternocoelis marginalis*** Normand, 1915

(Figs 7, 35 and 58)

*Sternocoelis marginalis* Normand, 1915: 255.

#### RE-DESCRIPTION

Colour light brown, shiny; body weakly convex; surface with dense setae of two different lengths on dorsal surface, glabrous on ventral surface.

Frons sparsely punctate; frontal stria cariniform, evanescent on epistoma; labrum slightly depressed, bisinuate; mandibles large and convex, smooth; antennal scape very enlarged, sparsely punctate and setose.

Pronotum subtrapezoidal (fig. 7); disc convex, with sides explanate; deep basal depression opposite to second dorsal stria; anterior angles not elevated and posterior angles not produced; marginal stria complete; with scarce and small setigerous granules. Elytra rounded, weakly convex, only with small setigerous granules; first dorsal stria complete, second and third confined to anterior half; marginal and outer subhumeral striae joined; epipleurae smooth, with an irregular anterior stria and another apical.

Pygidium with short setae, scantier on pygidium.

Prosternal lobe and keel separated by a shallow depression; prosternal lobe weakly prominent, not emarginate (fig. 35); prosternal keel narrow, with distinct inner striae, cariniform, complete, subparallel, distant at base; finely punctate between striae; outer prosternal striae obsolete. Mesosternum without lateral foveae; meso-metasternal excavation very deep. Metasternal disc smooth; sides regularly punctate; inner stria reaching metacoxae, the other two striae very oblique and long.

First abdominal sternite smooth.

Legs long and slender, regularly expanded in apical half (fig. 58), with short setae.

Aedeagus similar to *S. laevidorsis*.

Length 2.0-2.2 mm. Width 1.8-1.9 mm.

#### Type material

Four specimens of the type series have been studied. The lectotype and three paralectotypes are designated here [all in MNHN]. LECTOTYPE (accompanied by an ant) labelled: /T. Le Kef, Dr. Normand/, /*Marginalis* Norm./, /Paratype/. PARALECTOTYPES: two specimens with the two first labels as in the lectotype, and additional labels: /Coll. Dr. V. Auzat/ and /*Sternocoelis marginalis* Norm./ (accompanied by ants). One specimen labelled: /Tunis Le Kef/, /*Sternocoelis marginalis* Norm./.

#### Distribution

Only known from the environs of Le Kef (Tunisia).

#### Ecology

The type material was collected in the spring in the nests of *Cataglyphis mauritanicus* Emery in a mountainous area.

#### *Sternocoelis laevidorsis* (Fairmaire, 1876)

(Figs 36 and 75)

*Hetaerius laevidorsis* Fairmaire, 1876: 37.

*Sternocoelis laevidorsis* (Fairmaire): Lewis, 1888a: 155.

*Sternocoelis laevidorsis* var. *major* Pic, 1905: 129.

*Sternocoelis laevidorsis* var. *semiopacus* Normand, 1915: 256.

#### RE-DESCRIPTION

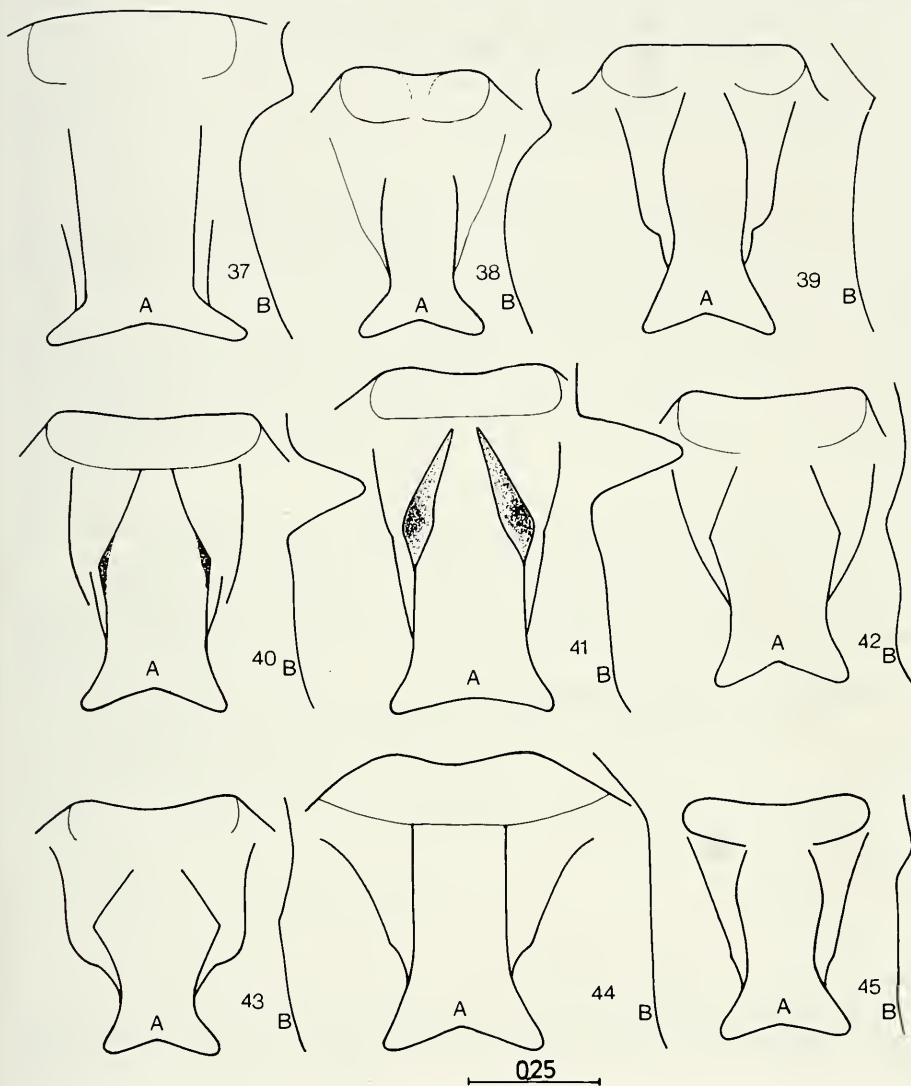
Colour reddish brown; body weakly convex, oval; dorsal surface with sparse and short setae laterally.

Frons wide, finely and sparsely punctate; frontal stria cariniform, evanescent on epistoma; labrum slightly depressed; mandibles large, convex and finely punctulate; antennal scape very enlarged, punctate, with short setae.

Pronotum finely punctulate, scanty on disc, rugose and denser on sides; sides of pronotum well separated from disc, explanate; marginal stria complete; anterior angles truncate, not elevated; posterior angles not produced. Elytra weakly convex, finely punctulate, with dense alutaceous microsculpture, producing a dull texture; first dorsal stria complete; second stria very fine, somewhat surpassing middle; third stria as a short and fine anterior trait; marginal stria coming joining outer subhumeral; epipleurae sparsely punctate, with an irregular segment of stria.

Pygidium and pygidium convex, well impressed and densely punctate.

Prosternal keel and lobe very rugose; lobe not bisinuate, at a lower level than keel (fig. 36); keel wide; inner prosternal striae faint, only on basal half; outer striae obsolete. Mesosternum smooth, without lateral foveae; meso-metasternal excavation



FIGS 37-45

Prosternal lobe and keel, ventral view (A), outline (B): *Sternocoelis grandis* (Reitter) (37); *S. robustus* (Pic) (38); *S. fuscus* (Schmidt) (39); *S. incisus* (Schmidt) (40); *S. acutangulus* (Lewis) (41); *S. bedeli* (Lewis) (42); *S. punctulatus* (Lucas) (43); *S. atlantis* Théry (44); *S. setulosus* (Reitter) (45). Scale in mm.

deep. Metasternum finely punctulate, with three long striae, inner stria reaching metacoxae; sides fossulate.

First abdominal sternite finely and evenly punctulate.

Legs relatively long and slightly expanded.

Aedeagus as figure 75.

Length 2.2-2.5 mm. Width 2.1-2.2 mm.

#### Type material

The type material of *Hetaerius laevidorsis* Fairmaire has not been located.

Two specimens of the type series of *S. laevidorsis* var. *major* Pic have been studied. The lectotype and one paralectotype are now designated [all in MNHN]. LECTOTYPE (accompanied by an ant) labelled: /Kerratra, 8.1901, de Vauloger/, /Type/, /major Pic (Alg.)/. PARALECTOTYPE, one specimen labelled as the lectotype.

Two specimens of the type series of *S. laevidorsis* var. *semiopacus* Normand have been studied. The lectotype and one paralectotype are now designated [all in MNHN]. LECTOTYPE (accompanied by an ant) labelled: /T. Sousse, Dr. Normand/, /laevidorsis var. semiopacus Frm. Co-Type/. PARALECTOTYPE, one specimen and one ant having the same first label, and an additional label: /v. semiopacus Norm./, /Coll. Dr. V. Auzat/, /S. laevidorsis v. semiopacus Norm./.

#### Other material examined

One specimen of the DEI labelled: /*Sternocoelis laevidorsis* Fairm./, /Kairouan Tunis Dr. Santsobil/, /Catagl. bicolor/, /Reichensperger determ./.

One specimen of the MHNG labelled as follows: /Teniet el Had/, /*grandis* Reitt./.

Eight specimens of the MNHN labelled: (1) /Kerratra, Algérie, Coll. Théry/, /*Sternocoelis laevidorsis* Frm./; (2) /Sgaeg Aurés, 20 juin 1922/; (3) /T. Sousse, Dr. Normand/; (4) /*Sternocoelis laevidorsis* Fairm./, /Kairouan, Tunis, Dr. Santsobil/, /Coll. Reichensperger/, /*laevidorsis* Frm./; (5) /Bledé Thala (Oued Edechellie) 25.1.1901/, /*Sternoscelis laevidorsis* Fair./; (6) /Yakouren (Algérie) Juin 1902 Dr. A. Chobaut/, /Coll. Dr. V. Auzat/, /*Sternoscelis laevidorsis* Fair./; (7) /Bir Becha, Reg. de Gafra, 20.1.1901/, /*Sternocoelis laevidorsis* Fair./; (8) /Tunisie, Sbi Kha Fr. F. Santsobil/, /12.1.01/, /*Sternoscelis laevidorsis* Fairm./, /Hadjeb El Aïoun, Tunisie, 1.IV.96/, /Coll. Dr. V. Auzat/, /*Sternocoelis laevidorsis* Frm./.

One specimen of the TY labelled: /Yakouren (Kabylie) Juin 1902, Dr. A. Chobaut/, /*Sternocoelis laevidorsis* Fairm./.

#### Distribution

This species occurs in the north-east of Algeria and the north of Tunisia.

#### Ecology

It inhabits mountainous areas and is active from January to June. They have been found with the ants *Cataglyphis bicolor* (Fabricius) and *C. viatica* (Fabricius).

***Sternocoelis grandis*** (Reitter, 1883)

(Figs 8, 37 and 59)

*Hetaerius grandis* Reitter, 1883: 143.

*Sternocoelis grandis* (Reitter): Lewis, 1888a: 151.

#### RE-DESCRIPTION

Colour, reddish brown, somewhat shiny; body convex, broadly oval; sides of body with short yellow setae.



Frons weakly depressed, rugosely punctate; frontal stria strongly cariniform, complete on sides, evanescent on epistoma; labrum weakly depressed; mandibles large, rugose and convex; antennal scape very enlarged, antennal surface rugose and setose.

Pronotum subtrapezoidal (fig. 8); disc weakly convex, sides clearly separated, explanate; anterior angles neither produced nor elevated; posterior angles not produced; marginal stria strong, distinct; disc coarsely and densely punctate; sides more coarsely and densely punctate, with deeper punctures, rugose next to marginal stria; pronotal base with a distinct depression. Elytra very broad and slightly convex; finely and densely punctate, mainly on anterior half, becoming rugose; first dorsal stria surpassing middle, second slightly shorter and third only marked by an elongate impression reaching middle; marginal stria strong, cariniform, complete, joined to outer subhumeral stria apically; surface between these two striae rugose, with setigerous punctures; epipleurae densely rugose, with two irregular striae, one of them almost complete, the other confined to apical half.

Propygidium and pygidium with large and dense punctures.

Prosternal lobe at lower level than keel, rugosely punctate and with shallow medial depression (fig. 37); prosternal keel densely rugose, with inner striae obsolete, subparallel, and the outer striae indistinct; sides of keel rugose. Mesosternum with dense and well impressed punctures, almost in a right angle to prosternum in lateral view, without lateral foveae; meso-metasternal excavation very deep. Metasternum with well impressed, irregular and very dense punctures on disc, deeper, larger and denser on sides; striae well impressed, weakly cariniform, the inner reaching metacoxae, the other striae reduced.

First abdominal sternite coarser and denser punctured than metasternum.

Legs setose, densely punctate; protibiae and mesotibiae expanded (fig. 59).

Male unknown.

Length 2.3 mm. Width 2.1 mm.

#### Material examined

One specimen ♀ [in MHNG] labelled as follows: /O. Jordanie, Haman al Sarah, 3-4-1964, J. Klapperich/, /*Sternocoelis grandis*/.

#### Distribution

The original description mentions "Talysch: Rasano". This is an unlikely type locality and possibly erroneous. It is possible that it lives either in Greece or in Turkey. The species is known from Jordan. Its presence here is a considerable range extension for the genus *Sternocoelis*.

#### Ecology

The species was collected early in spring.

#### *Sternocoelis robustus* Pic, 1910

(Figs 9, 26 and 38)

*Sternoscaelis robustus* Pic, 1910: 33 (*lapsus calami*).

*Sternocoelis robustus* Pic: Bickhardt, 1917 (justified emendation).

## RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex, oval; dorsal surface of body with short setae and additional longer setae on sides and legs.

Frons finely punctate; frontal stria regular, cariniform, evanescent on epistoma; labrum slightly depressed; mandibles large, convex and densely punctate; antennal scape very enlarged and with short setae.

Pronotum covered with fine and dense punctures, somewhat rugose on sides; disc very convex, separated from sides by a well marked oblique impression; sides explanate; marginal stria complete; anterior angles truncate, not elevated, posterior angles not produced (fig. 9); deep basal depression opposite to second dorsal stria.

Elytra weakly convex, finely and densely punctulate; marginal stria joining outer subhumeral; first dorsal stria very fine, complete; second stria very fine, reaching middle; epipleurae rugose, with short apical segment of stria (fig. 26).

Propygidium with dense setigerous punctures, pygidium more sparsely punctate.

Prosternal lobe at lower level than keel, both rugose and finely setose; prosternal lobe bisinuate, with medial depression (fig. 38); apical 2/3 of inner prosternal striae indistinct, remainder fine; outer prosternal striae very fine or obsolete. Mesosternum wide; meso-metasternal excavation deep; without lateral foveae. Metasternum finely and densely punctulate, with microsetae; inner stria not reaching metacoxae; sides fossulate.

First abdominal sternite finely and densely punctulate.

Legs long and very expanded.

Male unavailable.

Length 2.5 mm. Width 2.3 mm.

## Type material

Only known by the holotype ♀ [in MNHN] labelled: /Type/, /*Sternocoelis robustus* Pic/, /Libadia. Chypre/.

## Distribution

It is known only from the type locality, Cyprus island.

## Ecology

No biological data are available.

**Sternocoelis fuscus** (Schmidt, 1888)

(Figs 10, 39, 60 and 76)

*Hetaenius fuscus* Schmidt, 1888: 238.

*Sternocoelis mauritanicus* Lewis, 1888a: 152 (nov. syn.).

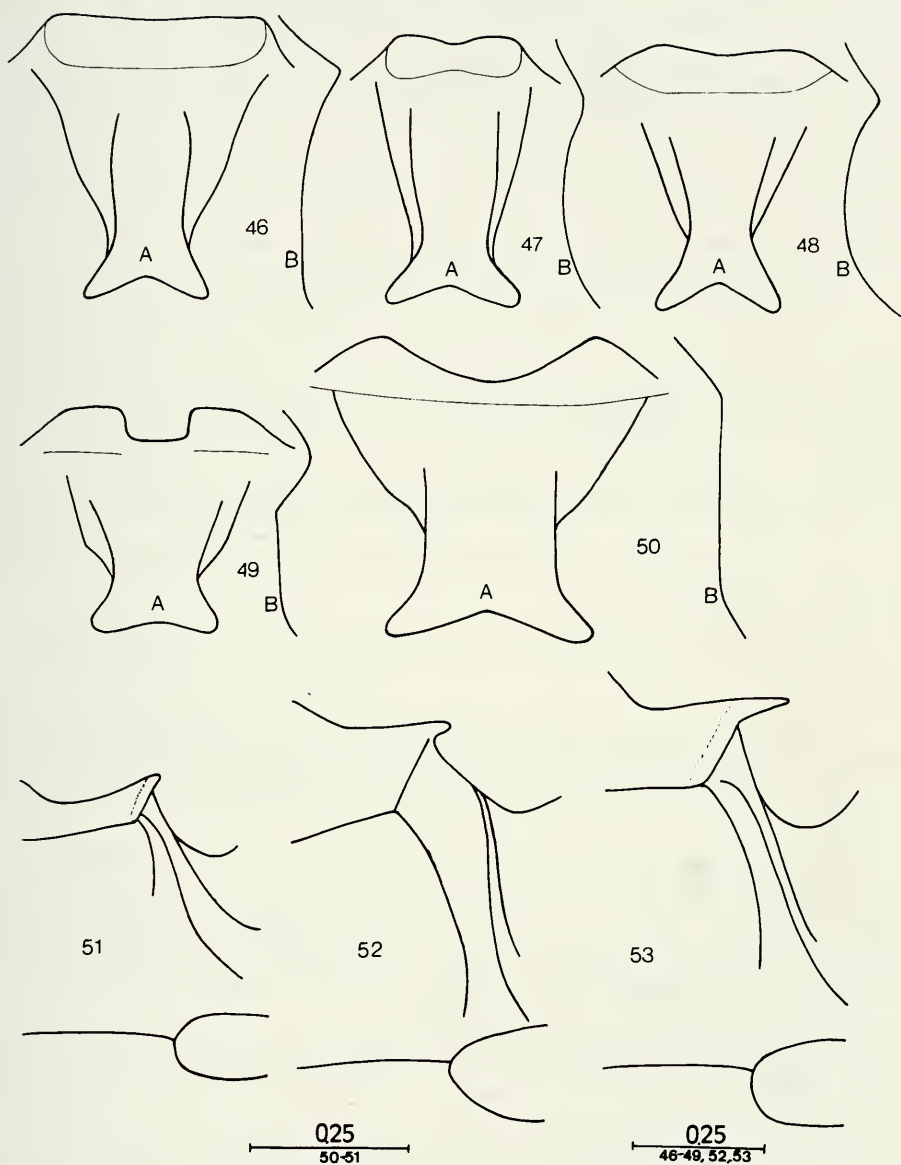
*Sternocoelis fuscus* (Schmidt): Lewis, 1888a: 152.

*Sternocoelis aureopilosus* Escalera, 1921: 128 (nov. syn.).

*Sternocoelis incisus* ssp. *mendizabali* Cobos, 1949: 578 (synonymized by Yélamos, 1993: 155).

## RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex, broadly oval; covered with long setae, longer on margins and propygidium.



FIGS 46-53

Prosternal lobe and keel, ventral view (A), outline (B): *S. hispanus* (Rosenhauer) (46); *S. arachnoides* (Fairmaire) (47); *S. slaoui* Théry (48); *S. comosellus* (Fairmaire) (49); *S. espadalari* n. sp. (50). Left half of mesosternum and metasternum: *S. vaucheri* Lewis (51); *S. merklii* (Schmidt) (52), *S. bedeli* (Lewis) (53). Scale in mm.

Frons rugose; frontal stria cariniform, irregular, crossing epistoma; labrum with medial depression; mandibles large and convex; antennal scape very enlarged and rugose.

Pronotum subtrapezoidal (fig. 10); densely punctate on sides and apical margin, anterior angles wide, slightly elevated, and posterior angles produced; pronotal base with an impression near first and second dorsal striae; marginal stria complete. Elytra weakly convex, finely and densely punctulate; first dorsal stria complete; second stria reduced apically; third stria only reaching middle; outer subhumeral stria joined to marginal; epipleurae rugose, with a stria parallel to marginal stria.

Propygidium and pygidium coarsely and densely punctate.

Prosternum with lobe clearly bisinuate, prominent, rugose, separated from keel by a shallow depression (fig. 39); keel with inner striae strong, not joined in front, rugosely punctate between; outer striae strong. Meso-metasternal excavation deep; mesosternum with fine oblique impressions next to mesocoxae. Metasternum finely punctate, with three fine lateral striae, the inner reaching near to metacoxae; sides fossulate.

First abdominal sternite strongly and densely punctate on disc, coarser and denser on sides.

Legs very expanded; meso- and metatibiae triangular (fig. 60); rugose, with short yellow setae.

Aedeagus as figure 76.

Length 1.4-1.7 mm. Width 1.3-1.5 mm.

#### Type material

The holotype ♀ of *Haeterius fusculus* Schmidt has been studied [in MNHU]: /Type/, /Andalusia/, /coll. J. Schmidt/, /fusculus Schmidt/, /Zool. Mus. Berlin/.

The holotype ♀ of *Sternocoelis mauritanicus* Lewis has been studied [in NHML]: /*Hetaerius mauritanicus* Lewis, Type/, /Type/, /Tangier, Lewis, 9.4.88/, /G. Lewis Coll., B.M. 1926-369/.

Four specimens of the type series of *Sternocoelis aureopilosus* Escalera have been examined. The lectotype and three paralectotypes are designated. LECTOTYPE [in MNCN] labelled: /Larache, M. Escalera/, /*Sternocoelis aureopilosus* Escalera, typ./.

PARALECTOTYPE [all in MNHN] labelled: (1) /Larache/, /Type/, /Type qui a servi à Escalera pour faire son dessin/, /*Sternocoelis aureopilosus*, Type, Esc./, /Coll. Dr. V. Auzat/, /*Sternocoelis aureopilosus* Esc./; (2) /Larache, 12.1.1921/, /Coll. Dr. V. Auzat/, /Paratype/, /*Sternocoelis aureopilosus* Esc./; (3) /Larache/, /Paratype/, /*Sternocoelis aureopilosus* Esc./.

The holotype ♀ of *Sternocoelis incisus mendizabali* Cobos was also studied [in the EEZA]: /*Sternocoelis incisus* ssp. *mendizabali* nov., Cobos Sánchez Det. 1949/, /Torremolinos, Málaga, (Hispania), Cobos Sánchez/, /Holotipo/.

#### Other material examined

Two specimens of the MHNG labelled as follows: (1) /Tanger, Olcese/; (2) /Lalla Mimouna, 8-3-62/, /Maroc, leg. R. Mussard/, /J. Théron det., 1963, *Eretmotus* sp. ? du groupe *ibericus* Bris./.

Five specimens of the MNCN: (1) /Tanger, M. Escalera/; (2) /1897 Tanger/; (3) /10.906, Tanger/, /*S. mauritanicus* Law./; (4) /Marruecos, Tanger, VI-1905 Escalera/; (5) /Hontanares, Hispania, IV-50, M. Escalera/, /*Sternocoelis incisus* Schm./.

Five specimens of the MNHN: (1 and 2) /Larache/, /Coll. Dr. V. Auzat/, /*Sternocoelis mauritanicus* Lew./; (3) /3.95, Tanger/, /Maroc, ex Musaeo, H. Vaucher 1908/, /*Sternocoelis*

*mauritanicus*); (4) /Tanger, Maroc/; (5) /Larache/, /Maroc, ex Escalera/, /Coll. Dr. V. Auzat/, /*Sternocoelis mauritanicus* Lew./.

Five specimens of the NHML, four of them labelled /1897, Tanger/, /Vaucher/, /G. Lewis Coll., B.M. 1926-369/ the fifth /4.95, Tangier/ with the same last label.

Two specimens in TY: (1) /Algeciras/; (2) /Koumch (circa Beni Mellal MA.), 1200 m, 17-V-84, X. Espalader leg./, /*Sternocoelis alluaudi*, Théry, J. de Ferrer det. 1986/.

## Distribution

This species has a wide distribution area with scarce localities. It is mainly known from the south of Spain (Andalusia) and north of Morocco (Tangier and Larache). It was also recorded by WALKER (1889) from Gibraltar. There are additional records from Hontanares (Segovia, central Spain) and Beni-Mellal, Morocco).

## Ecology

A clear cline exists for several morphological characters, the specimens from central Spain being very different from those of central Moroccan origin.

They have been collected in winter and spring at low and mid elevations. In Morocco they have been found in nests of *Aphaenogaster gemella* ssp. *maroccana* Forel.

***Sternocoelis incisus*** (Schmidt, 1885)

(Figs 11, 40 and 77)

*Hetaerius incisus* Schmidt, 1885b: 440.

*Sternocoelis incisus* (Schmidt): Lewis, 1888a: 155.

*Haeterius cruzi* Escalera, 1929: 375 (synonymized by Yélamos, 1993: 156).

*Haeterius cruzi* var. *micropilosus* Escalera, 1929: 378 (synonymized by Yélamos, 1993: 156).

*Sternocoelis cruzi* (Escalera): Mazur, 1984: 326.

## RE-DESCRIPTION

Colour dark brown, shiny; body weakly convex, broadly oval; covered with short setae, longer on margins.

Frons coarsely and densely punctate; frontal stria cariniform, irregular, crossing epistoma; labrum truncate, with shallow medial depression; mandibles large, convex, rugose; antennal scape strongly enlarged, rugose, with short setae.

Pronotum with broad, slightly elevated anterior angles; posterior angles produced (fig 11); pronotum with basal impression opposite to first and second dorsal striae: marginal stria complete; sides parallel; strongly and densely punctate, sparser on disc. Elytra weakly convex, expanded, finely and densely punctulate; first dorsal stria complete; second stria slightly surpassing middle; third stria shorter; outer subhumeral stria strong, cariniform, joined to fine and irregular marginal stria; epipleurae rugose, with short setae and a short irregular stria.

Propygidium and pygidium with dense setigerous pores.

Prosternum with broad keel; inner striae strong, prominent near depression and prolonged to it; between both inner striae there is a strongly and densely punctate

depression; depression between lobe and keel very deep (fig. 40); lobe prominent, rather rugose, setose; outer striae short and strong. Meso-metasternal excavation deep; sides mesosternum with narrow and deep lateral foveae, near metacoxae. Metasternal disc nearly smooth, rather depressed; lateral striae of metasternum fine; both inner striae long, not reaching metacoxae, outer stria shorter and evanescent.

First abdominal sternite convex; disc smooth; sides with large punctures.

Legs very expanded; meso- and metatibiae triangular, with dense punctures and setae.

Aedeagus as figure 77.

Length 1.8-2.1 mm. Width 1.4-1.7 mm.

#### Type material

The holotype ♀ of *Hetaerius incisus* Schmidt [in MNHU] has been examined. It is labelled: /Type/, /*incisus* typ. Schmidt/, /Hispania/, /coll. J. Schmidt/, /*incisus* Schmidt/.

The lectotype and one paralectotype of *Haeterius cruzi* Escalera have been studied [in MNCN]. Lectotype ♂ labelled: /Cercedilla, C. Bolivari/, /*St. Cruzi* typ. Esc./.

Paralectotype ♀: /Escorial, 20.5.1926/, /*St. Cruzi* Esc./.

The lectotype and 10 paralectotypes of *Haeterius cruzi* var. *micropilosus* Escalera have been studied [in MNCN]. Lectotype ♂ labelled: /Escorial, 14.5.1926/, /*St. cruzi* var. *micropilosus* Esc./ [in MNCN]. Paralectotypes: two ♀♀ with the same labels as the lectotype [in MNCN and MNHN]; four ♂♂ and four ♀♀ labelled: /Escorial, 20.5.1926/ [seven in MNCN and one in MNHN].

#### Other material examined

Three specimens of the DEI have been studied. Two specimens labelled: /Hispan./, /Coll. Franklin Müller/, /*Sternocoelis Marseullii* Bris./.

One specimen labelled: /Sr. Espuna, Hisp. mer. Ehlers./, /*syntypus*/, /*incisus* Schmidt/, /Coll. L. v. Heyden DEI Eberswalde/.

#### Distribution

Few records exist for this species and their distribution is therefore poorly known. *S. incisus* is known to occur in the mountains of central and south-eastern Spain (Sierra del Guadarrama, Madrid and Sierra de Espuña, Murcia).

#### Ecology

Specimens have been found mainly in spring. *S. incisus* inhabits nests of several species of *Aphaenogaster*.

#### *Sternocoelis alluaudi* Théry, 1921

(Figs 12 and 24)

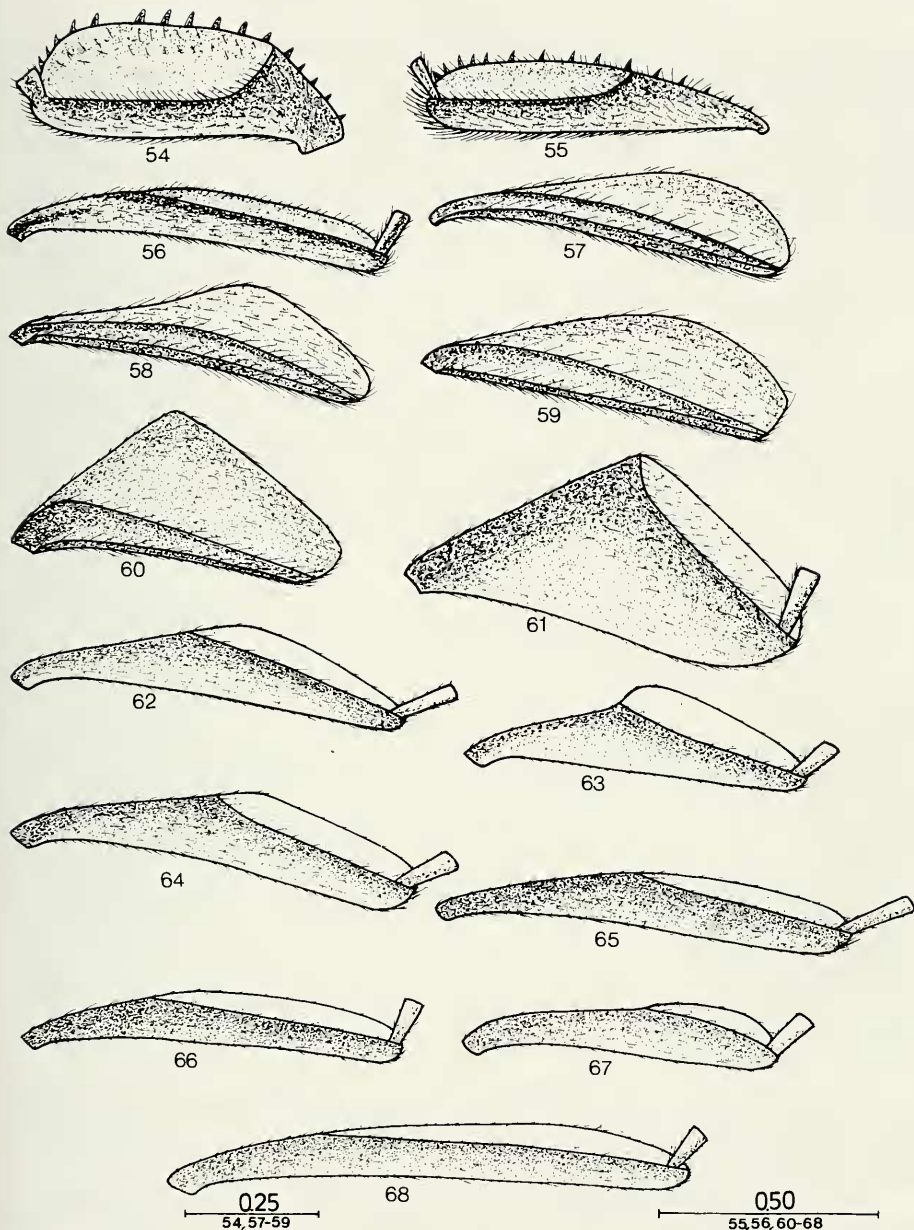
*Sternocoelis alluaudi* Théry, 1921: 19.

*Sternocoelis variolosus* Théry, 1921: 20 (nov. syn.).

*Sternocoelis loustali* Kocher, 1956: 367 (nov. syn.).

#### RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex; with short and sparse setae laterally and on legs.



FIGS 54-68

Right protibia, inner side: *Sternocoelis marseulii* (Brisout de Barneville) (54); *S. arachnoides* (Fairmaire) (55). Right mesotibia, inner side: *S. slaoui* Théry (56). Left metatibia, outer side: *S. otini* Peyerimhoff (57); *S. marginalis* Normand (58); *S. grandis* (Reitter) (59); *S. fuscus* (Schmidt) (60). Right metatibia, inner side: *S. acutangulus* (Lewis) (61); *S. atlantis* Théry (62); *S. setulosus* (Reitter) (63); *S. hispanus* (Rosenhauer) (64); *S. arachnoides* (Fairmaire) (65); *S. slaoui* Théry (66); *S. comosellus* (Fairmaire) (67); *S. espadaleri* n. sp. (68). Scale in mm.

Frons rugose, depressed, and sparsely setose; frontal stria cariniform, interrupted on epistoma; labrum long, smooth; mandibles convex, stout, punctate on lateral area, glabrous; antennal scape very enlarged (fig. 24), rugose, with scarce setae.

Pronotum convex, coarsely, densely punctate, punctures regularly distributed; marginal stria distinct; anterior angles truncate (fig. 12), slightly elevated; posterior angles gradually produced; with shallow depression near posterior angles. Elytra rather expanded, subparallel; surface coarsely and densely punctate; first dorsal stria complete; second stria slightly surpassing middle, third stria shorter; outer subhumeral stria complete, joined to marginal stria; epipleurae somewhat rugose, without striae.

Propygidium and pygidium coarsely, densely punctate and setose.

Prosternum rugose, with short setae; prosternal lobe at right angle in relation to keel in lateral view; with deep depression between keel and lobe; inner prosternal striae cariniform, very prominent and wide, sinuate, forming a medial projection; outer striae cariniform. Meso-metasternal excavation very wide and deep; lateral foveae deep. Metasternum finely punctulate on disc, fossulate on sides; inner lateral stria short, only reaching middle, both outer striae approaching, almost reaching metacoxae.

First abdominal sternite finely punctulate.

Legs very short and very expanded, densely punctate and setose.

Aedeagus morphology typical of the genus.

Length 1.7-1.9 mm. Width 1.4-1.5 mm.

#### Type material

Three specimens of the type series of *Sternocoelis alluaudi* Théry have been examined (accompanied with ants). The lectotype and two paralectotypes are now designated. LECTOTYPE labelled: /Ain Leuh, 112/, /Type/, /*Sternocoelis alluaudi* Théry/, /Type/, [in MNHN]. PARALECTOTYPES labelled: (1) /Ain Leuh, 1500 m. Alluaud 84/, /*Sternocoelis alluaudi*, Théry/, /Vendu par Théry au 1938/, /Type/ [in MNHN]; (2) /M. Atl., Maroc, Coll. Théry/, /*Alluaudi* Théry/, /Cotype/ [in MNCN].

The holotype of *Sternocoelis variolosus* Théry [in MNHN] was also studied labelled as follows: /Dradek près Rabat, Alluaud 63/, /*Sternocoelis variolosus*, Type, Théry/, /Type/ (accompanied with an ant).

The holotype of *Sternocoelis loustali* Kocher has not been loaned by the Institut Scientifique Chérifien from Rabat. On the basis of the description, I regard it as a new synonym.

#### Other material examined

Seven specimens of the MNCN have been examined, labelled as follows: (1 and 2) /Iguermalen, Targuist, Rif, VI-1930, Exp. C. Bolivar/; (3) /Iguermalen, Beni Mesdui, VI-1932, M. Escalera/; (4) /Imasinen, Beni Seddat, Rif, VI-1930, Exp. C. Bolivar/; (5) /Bab Chiquer, Ketama, Rif, VI-1932, M. Escalera/; (6 and 7) /Azrou, 5 Mai 29, A. Théry/.

Three specimens of the MNHN were also seen and labelled: (1) /Bou Chaut, Maroc, Coll. Théry/, /Coll. Dr. V. Auzat/, /*Sternocoelis alluaudi* Théry, Théry det./; (2) /Azrou, 5 Mai 29, A. Théry/, /voir *acutangulus* Lewis/; (3) /Daïet Ifrane/, /*St. acutangulus* Lew. 22/.

One specimen was examined of the TY labelled: /Dayet Ifrah, Marruecos, 1750 m, P. Rotraw leg./.

#### Distribution

*S. alluaudi* is known from the Moyen-Atlas and Rif mountains, and from the environs of Salé, Morocco.



## E c o l o g y

This species inhabits the nests of *Aphaenogaster* sp., mainly in mountainous areas. It is active from late spring to early summer.

***Sternocoelis acutangulus*** (Lewis, 1887)

(Figs 13, 41, 61 and 85)

*Hetaerius acutangulus* Lewis, 1887: 164.

*Sternocoelis acutangulus* (Lewis): Lewis, 1888a: 146.

## RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex and stout; covered with short yellow setae.

Frons with coarse and dense punctures; frontal stria cariniform, irregular, evanescent on epistoma; labrum with a shallow impression; mandibles large, convex, densely punctate; antennal scape greatly enlarged and rugose.

Pronotum convex, with anterior angles slightly elevated; posterior angles strongly produced (fig. 13); sides parallel; base of pronotum with impression near base of first dorsal stria; marginal stria partially evanescent; surface densely covered with large shallow punctures, irregular and rugose on anterior angles of pronotum. Elytra strongly expanded, weakly convex; surface with mixture of dense punctures, setigerous pores, and other smaller punctures; first dorsal stria complete; second stria shortened apically; third stria reaching middle; outer subhumeral stria very long, well impressed, curved toward epipleurae at apical half; marginal and outer subhumeral striae joined; epipleurae rugose, with short setae, lacking striae.

Propygidium and pygidium with dense setigerous pores.

Prosternum strongly rugose; inner striae well impressed, with wide projections near to depressed zone; depression between lobe and keel deep and narrow (fig. 41); these striae converge on depressed part; prosternal lobe less prominent than projections of inner striae; outer prosternal striae short and well impressed. Mesometasternal excavation very deep; sides mesosternum with deep and wide lateral foveae. Metasternum finely punctulate; inner lateral stria fine, reaching middle of prosternum, median stria are stronger and longer, very oblique, but reaching metacoxae, very fine and short the outer stria; sides fossulate.

First abdominal sternite finely and densely punctate, with coarser punctures on sides.

Legs long, strongly expanded, rugose and setose; meso- and metatibiae triangular (fig. 61).

Aedeagus morphology typical; spiculum gastrale as in figure 85.

Length 1.8-2.4 mm. Width 1.4-2.1 mm.

## Type material

The type series containing a lectotype and four paralectotypes have been examined [all in NHML]. Lectotype, a ♂ labelled: /Tangier, Lewis, 8.4.88/, /G. Lewis Coll. B.M. 1926-369/. Paralectotypes, a ♀ with the same first and second labels, moreover /*Hetaerius acutangulus*

Type, Lewis/. Two ♀♀ and a ♂ (all accompanied by ants) with the same first and second labels, moreover [*Sternocoelis acutangulus*].

#### Other material examined

Four specimens of the DEI labelled: (1 and 2) /Maroc/, /Coll. Stierlin/, [*S. acutangulus* Lewis/]; (3) /Marocco, Coll. O. Leonhardt/, [*Sternocoelis acutangulus* Lewis/]; (4) /1897, Tanger/, [*acutangulus* Fairm., Tanger Desbr./, /Coll. L. v. Heyden, DEI Eberswalde/.

Five specimens of the MNCN labelled: (1 and 2) /1897 Tanger/, [*S. acutangulus* Lewis/]; (3) /Iguermalen, Targuist, Rif, VI-1930 Exp. C. Bolivar/; (4 and 5) /Larache, M. Escalera/, /MNCN Madrid/.

Nineteen specimens of the MNHN labelled: (1) /Tanger, Lewis, 8.4.88/, [*acutangulus*, Lewis 89, Tanger/]; (2) /3.44, Tanger/; (3) /Tanger/; (4) /1897, Tanger/; (5) /Larache/, /Ex. typique qui a servi à Escalera pour faire son dessin/, /Coll. Dr. V. Auzat/, /Type/, [*Sternocoelis acutangulus* Lew./]; (6, 7, 8, 9 and 10) /Larache/, /Maroc, ex Escalera/, /Coll. Dr. V. Auzat/, /Paratype/, [*Sternocoelis acutangulus* Lew./]; (11) /6.94, Tanger/, [*acutangulus*], [*Sternocoelis acutangulus* Lew./]; (12) /Maroc, ex Musaeo, H. Vaucher 1908/, [*Sternocoelis acutangulus* Lew./]; (13 and 14) /Larache, Maroc/, [*Sternocoelis acutangulus* Lew./]; (15) /Gibraltar, ex Coll. Bonnaire/, /Gibraltar/, [*acutangulus* Lewis, ex ipso/, /Coll. Dr. V. Auzat/, [*Sternocoelis acutangulus* Lew./]; (16) [*Sternocoelis acutangulus*], /Tanger, Lewis, 10-4-88/, /Muséum Paris, Coll. de Marseul, 1890/, [*Hetaerius acutangulus* Lewis/]; (17) /5.95, Tangier/, /Lewis det./, /Muséum Paris, 1933, Coll. Desbordes/, [*acutangulus* Lewis/]; (18) /Maroc, E. Tisson/, /Muséum Paris, 1933, Coll. Desbordes/, [*Sternocoelis acutangulus*, Peyer. det. 1914/]; (19) /Gibraltar, J.J. Walker/, [*Sternocoelis acutangulus* Lew./].

Seven specimens (accompanied by ants) of the NHML labelled as follows: (1) /Tangier, Lewis, 9-4-88/, /G. Lewis Coll., B.M. 1926-369/ (all the specimens contain this label); (2) /Tangier, (Olcese), 1896/; (3) /Tangier, (Lewis), 31.3.88/, [*Sternocoelis acutangulus* Lewis/]; (4) /Tangier, Lewis, 4.4.88/; (5 and 6) /Tangier, 5.95/, [*Sternocoelis acutangulus* Lewis/]; (7) /Gibraltar, J.J. Walker/.

Two specimens of the NHMW: /Tanger, Herrmann/.

Five specimens of the TM, four of them labelled /Gibraltar, J.J. Walker/, [*Sternoc. acutangulus* Lew., Coll. Reitter/ and one more specimen labelled /Tangier, Lewis, 9.4.88/ and the same second label.

Four specimens of TY all labelled /Tanger 1897/, [*Sternocoelis acutangulus* Lewis/].

#### Distribution

The species occurs in northern Morocco (Tangier and Rif regions) and southern Iberian Peninsula (only known from Algeciras, Cádiz, and Gibraltar). It is very common in and around Tangier.

#### Ecology

*S. acutangulus* is active in winter and spring at low and middle elevations. In Morocco the species inhabits nests of *Aphaenogaster sardoa* Mayr.

#### *Sternocoelis pluristriatus* (Fairmaire, 1877)

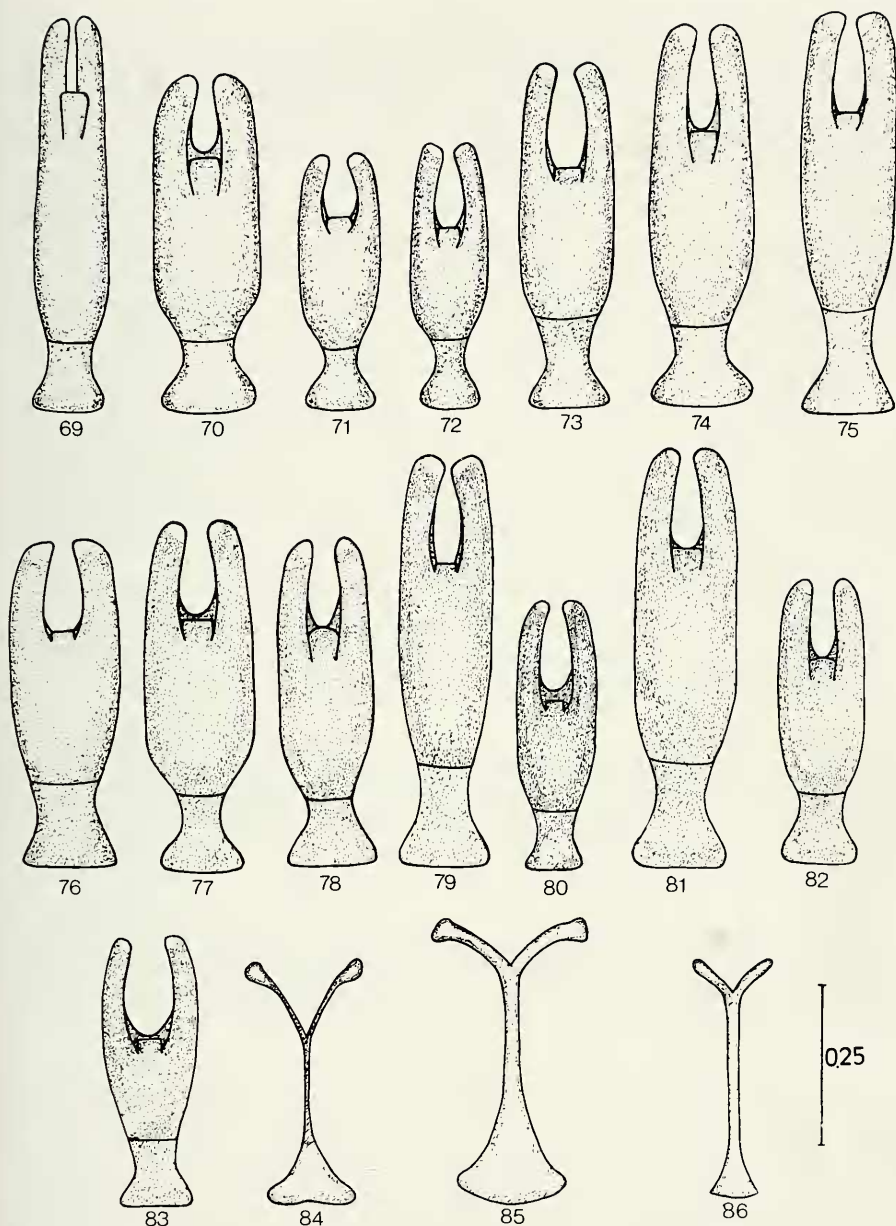
(Fig. 14)

*Hetaerius pluristriatus* Fairmaire, 1877: 98.

*Sternocoelis pluristriatus* (Fairmaire): Lewis, 1888a: 151.

#### RE-DESCRIPTION

Colour light brown, shiny; body weakly convex; covered with yellow medium-length setae.



FIGS 69-86. Aedeagus in dorsal view: *Hetaerius ferrugineus* (Olivier) (69); *Sternocoelis viaticus* Lewis (70); *S. marseullii* (Brisout de Barneville) (71); *S. vaucheri* Lewis (72); *S. puberulus* (Motschulsky) (73); *S. merklia* (Schmidt) (74); *S. laevidorsis* (Fairmaire) (75); *S. fuscus* (Schmidt) (76); *S. incisus* (Schmidt) (77); *S. bedeli* (Lewis) (78); *S. setulosus* (Reitter) (79); *S. hispanus* (Rosenhauer) (80); *S. arachnoides* (Fairmaire) (81); *S. comosellus* (Fairmaire) (82); *S. espadaleri* n. sp. (83). Spiculum gastrale in dorsal view: *S. marseullii* (Brisout de Barneville) (84); *S. acutangulus* (Lewis) (85); *S. espadaleri* n. sp. (86). Scale in mm.

Frons finely rugose; frontal stria cariniform, irregular, evanescent on epistoma; labrum flat and truncate; mandibles large, convex, punctate; antennal scape very enlarged and rugose.

Pronotum subtrapezoidal, weakly convex; anterior angles truncate and slightly elevated; posterior angles not produced (fig. 14); marginal stria fine and complete; surface finely, sparsely punctate, chiefly on disc; shallow depression opposite to base of second dorsal stria. Elytra weakly convex, with irregular and dense punctures; first dorsal stria complete; second stria reaching apical  $2/3$ ; third stria on anterior half; fourth stria as an anterior arch; outer subhumeral stria complete, joined to marginal at middle; epipleurae rugose and without striae.

Propygidium coarsely and densely punctate. Pygidium less densely punctate.

Prosternum with lobe and keel at about the same level, rugose and with short setae; prosternal lobe bisinuate; outer prosternal striae well impressed; inner striae strong, with a projection on apical  $2/3$ , then finer (prosternal lobe and keel like *S. punctulatus*). Meso-metasternal excavation deep; mesosternum with deep lateral foveae. Metasternum with disc finely punctulate; sides coarsely and irregularly punctate; striae distinct, inner short, outer striae long.

First abdominal sternite finely punctulate.

Legs short, stout, setose; meso- and metatibiae very expanded, triangular.

Aedeagus with the common morphology.

Length 1.5-1.6 mm. Width 1.2-1.3 mm.

#### Type material

Three specimens from the type series have been examined. The lectotype and two paralectotypes are now designated. LECTOTYPE labelled: /Daya/, /Type/, /*pluristriatus*/ [in MNHN]. PARALECTOTYPES labelled: (1) /exemplaire typique, *pluristriatus*, Daya Taiza/ [in MNHN]; (2) /Type/, /Daya, Bedel/, /exemplaire typique/, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, /*pluristriatus* Fairm./ [in MNHU].

#### Other material examined

Eight specimens (accompanied by ants) from the MNHN labelled as follows: two specimens without labels in collection Desbordes; five specimens labelled /Bou Berak près Dellys, Algérie/, /*Sternocoelis pluristriatus*/; one specimen with the two same labels as well as /comparé au Type (Coll. Bedel) 11-7e-28 Auzat/ and /Coll. Dr. V. Auzat/.

#### Distribution

This species is only known from Dhaya (Tlemcen region) and Dellys, north of Algeria.

#### Ecology

*S. pluristriatus* is active in spring and inhabits the nests of *Aphaenogaster* sp. at middle altitude.

***Sternocoelis bedeli*** (Lewis, 1884)

(Figs 15, 42, 53 and 78)

*Hetaerius bedeli* Lewis, 1884: 83.

*Hetaerius politus* Schmidt, 1888: 237 (nov. syn.).

*Sternocoelis cancer* Lewis, 1888a: 147 (nov. syn.) (synonymized of *S. politus* by Lewis, 1894: 150).

*Sternocoelis bedeli* (Lewis): Lewis, 1888a: 147.

*Sternocoelis exstructisternum* Lewis, 1888a: 150 (nov. syn.).

*Sternocoelis pectoralis* Lewis, 1888a: 152 (nov. syn.).

*Sternocoelis politus* (Schmidt): Lewis, 1888a: 154.

*Sternocoelis sedilloti* Lewis, 1889: 285 (nov. syn.) (synonymized of *S. politus* by Lewis, 1894: 150).

#### RE-DESCRIPTION

Colour dark brown, shiny; body weakly convex; with irregularly spaced yellow erect mid-length setae, sometimes lacking or dense on pronotum, elytra and prosternum, with or without dense setae.

Frons finely rugose; frontal stria cariniform, evanescent on epistoma; labrum slightly depressed; mandibles large, convex, densely punctate; antennal scape very enlarged, rugose, with short setae.

Pronotum weakly convex anteriorly, sometimes with setae; anterior angles truncate, slightly elevated, and posteriorly produced (fig. 15); marginal stria complete; sides not parallel; surface densely punctured on anterior half, smaller and sparsely punctulate on remainder. Elytra not parallel, strongly enlarged on shoulders; densely punctate, without setigerous pores; first dorsal stria complete, second slightly longer than half, and third as a short anterior trait; outer subhumeral and marginal striae approaching medially, not united; epipleurae rugose, without striae.

Propygidium with coarse and dense setigerous punctures. Pygidium similarly punctate, but less densely so.

Prosternal lobe and keel at same level, rugose and setose; lobe emarginate; prosternal striae strongly impressed, the inner very distant, with medial projections (fig. 42). Meso-metasternal excavation deep; mesosternum with very deep lateral foveae. Metasternum with inner lateral stria fine and short, medial and outer very oblique, almost reaching metacoxae (fig. 53); disc finely and densely punctulate; sides with irregular and dense punctures.

First abdominal sternite finely and densely punctulate.

Legs very robust, with tibiae very expanded, punctate and setose.

Aedeagus as figure 78.

Length 1.7-2.1 mm. Width 1.5-1.8 mm.

#### Type material

Two specimens of the type series of *Hetaerius bedeli* Lewis have been examined (series originally composed by three specimens). The lectotype and one paralectotype are now designated. LECTOTYPE labelled: /*Hetaerius Bedeli* Lewis, Type/, /Type/, /Recd. from Bedel 7-4-84/, /Daya, XI.75/, /G. Lewis Coll., B.M. 1926-369/ [in NHML]. PARALECTOTYPE: /Type/, /Daya, XI.75/, /exemplaire typique/, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, /*Bedeli* Lewis/.

Three specimens of the type series of *Hetaerius politus* Schmidt have been examined. The lectotype and two paralectotypes are now designated. LECTOTYPE labelled: /Type/, /Edough/, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, /*politus* Schmidt/ [in MNHU]. PARALECTOTYPES two specimens labelled /Edough, coll. Bonnair/, /Edough/, /Type/, /*Hetaerius politus* Schmidt, Type/, /*Sternocoelis politus* Schm./.

Sixteen specimens of the type series of *Sternocoelis cancer* Lewis have been examined. The lectotype and 15 paralectotypes are now designated. LECTOTYPE labelled: /*Sternocoelis*

*cancer*, Lewis Type/, /H. Rirha Lewis, 27.2.88/, /Type/, /G. Lewis Coll., B.M. 1926-369/ [in NHML]. PARALECTOTYPES: ten specimens /Hamman Rirha, (Lewis), 6.3.88/, /*S. cancer* Lewis/ and the same last label [in NHML]; one specimen /Hamman Rirha, Lewis, 26.2.88/, /*Sternocoelis cancer* Lewis/ and the same last label [in NHML]; one specimen /H. Rirha, 27.2.88, Lewis/ and the same two last labels [in NHML]; one specimen /H. Rirha, Lewis/, /Type/, /Coll. Bonnaire/, /Coll. Dr. V. Auzat/, /*Sternocoelis cancer* Lewis/ [in MNHN].

The holotype of *Sternocoelis extructisternum* Lewis has been studied, labelled as follows: /*Hetaerius extructisternum*, Lewis, Type/, /Coll. Mouchicourt 1879/, /Algeria/, /Type/, /G. Lewis Coll., B.M. 1926-369/ [in NHML].

The holotype of *Sternocoelis pectoralis* Lewis has been studied, labelled: /*Hetaerius pectoralis*, Lewis, Type/, /Tlemcen, Lewis, 21.3.88/, /G. Lewis Coll., B.M. 1926-369/ [in NHML].

I was not able to study the type series of *Sternocoelis sedilloti* Lewis. Instead I examined one specimen compared with the type by Lewis (see below).

#### Other material examined

Two specimens of the DEI labelled as follows: (1) /Coll. Kraatz/, /Bickhardt det./, /*Sternocoelis cancer* Lew./; (2) /Hamman/, /Coll. Kraatz/, /Bickhardt det./.

One specimen of the MHNG labelled as follows: /Bougie, Kabylie, L. Puel/, /*politus*/.

Seventeen specimens of the MNHN labelled as follows: (1) /Mt. Babor, Algérie/, /*Sternocoelis cancer* Lew./; (2) /Bougie, L. Coutazar/, /Coll. Dr. V. Auzat/, /*Sternocoelis politus* Schm./; (3) /Bou Berak près Dellys, Algérie/, /Coll. Dr. V. Auzat/, /*Sternocoelis politus* Schm./; (4) /Kurota, mai 1901/; (5) /*cancer*/, /*Sternocoelis cancer* Lew., Lewis 99, Cirta 3.5.1894/; (6) /St. Charles, Algérie, A. Théry/, /4.3.91/; (7) /El Routerez, Algérie, Coll. Théry, 17.3.94/, /*politus* Sch. (*cancer* Lewis)/; (8) /Oued Chesp, L. Clouet des Pesrouches à Medjez-Amar, Algérie/; (9) /Mt. Babor, 1901, Vauloger/; (10 and 11) /Bugeaud, L. Clouet des Pesrouches à Medjez-Amar, Algérie/; (12) /Mt. Babor, Algérie, Coll. Théry/; (13) /Sidi Abdelkalai, Blida, 16.4.1914/; (14) /Medjez-Amar, Algérie, L. Clouet des Pesrouches/, /*Sternocoelis politus*/; (15) /Coll. Bickhardt/, /Muséum Paris, 1933, Coll. Desbordes/, /*Hetaerius cancer* Lewis/; (16) /Bou Berak près Dellys, Algérie/, /*Sternocoelis pectoralis* Lew./; (17) /*Sternocoelis* Lew. 88/, /Mt. Rirha, Lewis/, /Muséum Paris, Coll. de Marseul, 1890/, /*Hetaerius Bedeli* Lewis/.

Seven specimens of the MNHU labelled: (1 and 2) /H. Rirha, Lewis/, /*Hetaerius Bedeli* Lewis/, /Zool. Mus. Berlin/ (all the specimens with this label); (3, 4 and 5) /Meskoutin, 8.4.92/, /*Sternocoelis Cancer* Lewis/; (6) /Cirta, 3.5.94/, /*Sternocoelis cancer* Lewis/, /69562/; (7) /H. Rirha, Lewis/, /*cancer* Lewis/.

Sixteen specimens of the NHML: (1) /Constantine, 28.3.92/, /*Sternocoelis Sedilloti* Lewis, compared with Type, 15.5.92/, /G. Lewis Coll., B.M. 1926-369/ (the fifteen first specimens with this label); (2 and 3) /Kabylie 1897/, /Yakouren/, /*S. bedeli* Lew./; (4) /Cirta, 2.5.94/. (5) /Frenda, Oran, Lutand/; (6) /Algiers, Bois de Bol, 9.5.92/, /*Sternocoelis cancer* Lewis/; (7, 8 and 9) /Cirta, 3.5.94/; (10 and 11) /Cirta, 2.6.94/; (12) /Blida, 28.4.92/; (13, 14 and 15) /Meskoutin, 8.4.92/; (16) /Sharp Coll., 1905-3.3/, /*S. cancer* Lew./.

One specimen of the TM: /H. Rirha, Lewis/, /*Sternoc. cancer* Lew., Coll. Reitter/.

Ten specimens of the TY, five of them labelled /Bou Berak, près Dellys, 6-11 Mai 1901, Dr. A. Chobaut/, /*punctulatus*/.

#### Distribution

*S. bedeli* is the most common species in northern Algeria, from Tlemcen to Annaba.

#### Ecology

This species is active from November to June at low and middle altitude. It inhabits the nests of *Aphaenogaster canescens* Emery and *A. depilis* Santschi.

***Sternocoelis punctulatus*** (Lucas, 1855)

(Figs 16 and 43)

*Hoeterius punctulatus* Lucas, 1855: 4 (error).*Sternocoelis punctulatus* (Lucas): Lewis, 1888a: 154.*Hetaerius cavisternus* Marseul, 1862: 713 (synonymized by Lewis, 1888a: 154).*Hetaerius lioderus* Fairmaire, 1877: 98 (synonymized by Lewis, 1888a: 154).

## RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex; with long yellow, aligned and reclinate setae.

Frons with small setigerous punctures; frontal stria cariniform, evanescent on epistoma; labrum flat, truncate; mandibles large, convex, finely punctulate; antennal scape very enlarged, rugose and setose.

Pronotum trapezoidal, with anterior angles wide, truncate and slightly elevated; posterior angles weakly produced (fig. 16); marginal stria complete; surface with dense punctures on anterior part, sparser on rest, disc almost smooth; shallow impression near base of second dorsal stria. Elytra with sides parallel; weakly convex; first dorsal stria complete, second and third reaching middle; outer subhumeral stria complete; marginal and outer subhumeral striae united medially; epipleurae irregularly punctate, with deep elongate median impression, without striae; elytra finely and sparsely punctulate, mixed with coarse setigerous punctures.

Propygidium with dense setigerous punctures. Pygidium with smaller and less dense punctures.

Prosternal lobe and keel at approximately the same level, rugose; inner prosternal striae well impressed, with two projections on apical 2/3 (fig. 43), then evanescent, outer prosternal striae well impressed. Meso-metasternal excavation deep; mesosternum with narrow and deep lateral foveae. Metasternum more finely punctate on disc; inner lateral stria short, only reaching middle; outer striae long, not reaching metacoxae; sides with coarse, irregular and dense punctures.

First abdominal sternite finely punctulate.

Legs stout and very expanded, with microsetae and macrosetae.

Aedeagus with the common morphology.

Length 1.7-1.9 mm. Width 1.4-1.5 mm.

## Type material

The holotypes of *Hoeterius punctulatus* Lucas (1) and *Hetaerius lioderus* Fairmaire (2) have been studied [both in MNHN] and are labelled as follows: (1) /Berrouaghia/, /*punctulatus* Luc., Coll. Ancey/, /Type/, /Ex. retrouvé dans la Coll. Ancey v. notes Bedel, Dr. Auzat/, /Coll. Dr. V; Auzat (c.v.)/, /*Sternocoelis punctulatus* Luc./; (2) /Pic ?/, /*S. lioderus* Fair., Coll. Bonnaire/, /Coll. Dr. V. Auzat/, /*Sternocoelis punctulatus* Luc./.

Two specimens of the type series of *Hetaerius cavisternus* Marseul have been examined [all in MNHN]. The lectotype and one paralectotype are now designated. LECTOTYPE labelled: /*Hetaerius cavisternus*, Constantine/, /Tipus de Marseul/. PARALECTOTYPE labelled: /*Hetaerius cavisternus*/, /*Hetaerius cavisternus punctulatus*, Alger, Lewis/, /Muséum Paris, Coll. de Marseul, 1890/.

## Other material examined

Seven specimens of the DEI: (1) /T. el Had, 1.5.92/, /Coll. Kraatz/, /Bickhardt det./, /*S. punctulatus* Lucas/; (2, 3, 4 and 5) /Berrouaghia, Alger, Ancey/, /*punctulatus* Luc./, /Coll. L. v.

Heyden, DEI Eberswalde/; (6) /Dra el Mizan/, /Ancey/, /Coll. L. v. Heyden, DEI Eberswalde/; (7) /Kabyliya, Ancey/, /Coll. L. v. Heyden, DEI Eberswalde/.

Four specimens of the MHNG: (1) /T. el Had/, /*Sternocoelis punctulatus* Lew./; (2 and 3) /Teniet el Had/, /*Lioderus Fairm.*/, /*punctulatus brevisternus*, *Lioderus*/; (4) /*pluristriatus*, *Daya*/.

Twenty-one specimens of the MNHN: (1) /Boghari, 6.3.1914/, /Muséum Paris, ex Coll. P. de Peyerimhoff/; (2, 3, 4, 5, 6, 7 and 8) /Bou Berak près Dellys, Algérie/, /Coll. Dr. V. Auzat (c.v.)/, /*Sternocoelis punctulatus* Luc./; (9) /Roussel, constatation/; (10) /Teniet el Had, avril/, /*Sternocoelis punctulatus*/; (11) /Boghari, Ancey/, /Muséum Paris, 1933, Coll. Desbordes/, /*punctulatus* (Coll. Bickhardt)/; (12 and 13) /Bône, abr. 93/, /*cavisternus*/; (14) /Bonalem, Berrouaghia, 27.4.1934/, /*Sternocoelis punctulatus* Lucas/; (15) /Teniet/, /*Sternocoelis punctulatus* Luc., Lewis 99/, /Teniet el Had/; (16) /T. el Aid, 2.5.92/, /*punctulatus* Lucas/; (17) /Zuauïa des Mouzaïna, 29 mai 1919/; (18) /Medeah/, /Typiques Théry/; (19) /Tiaret, dépt. d'Oran, de Vauloger/; (20) /Garn el Kef, Mouzaïre, Mai 1906/, /*Sternocoelis punctulatus* Lucas/; (21) /Lalac, 19 mai 1907/, /*Sternocoelis punctulatus* Lucas/.

Five specimens of the MNHU labelled: (1) /Algier/, /Coll. J. Schmidt/, /Zool. Mus. Berlin/; (2) /Teniet el H. Bedel, IV.81/, /*lioderus Fairm.*/, /Zool. Mus. Berlin/; (3, 4 and 5) /Teniet Had, 1.5.92/, /*punctulatus* Lucas/, /Zool. Mus. Berlin/.

Two specimens of the TM labelled: /Bou Berak, près Dellys, Algérie/, /*Sternoc. punctulatus* Luc., Coll. Reitter/.

Sixteen specimens of the TY all labelled /Bou Berak, près Dellys, 6-11 Mai 1901, Dr. A. Chobaut/, /*punctulatus*/.

## Distribution

*S. punctulatus* is very common in the northern Algeria.

## Ecology

This species were collected in winter and spring at middle altitudes. They inhabits nests of *Aphaenogaster* sp. and *Messor barbarus*.

## *Sternocoelis atlantis* Théry, 1921

(Figs 17, 44 and 62)

*Sternocoelis atlantis* Théry, 1921: 17.

## RE-DESCRIPTION

Colour light brown, shiny; body rather convex; covered with two types of dense setae.

Frons very rugose, with dense long setae; frontal stria cariniform, irregular, evanescent on epistoma; labrum slightly concave, truncate; mandibles large, convex, rugosely punctate and covered with dense microsetae; antennal scape very enlarged, surface rugose and microsetose.

Pronotum weakly convex; anterior angles truncate and elevated, posterior very produced (fig. 17); sides subparallel, with marginal stria complete; surface covered with dense setigerous punctures, almost rugose near anterior angles; with a deep depression near base second dorsal stria. Elytra wide and convex; first dorsal stria complete, second fine, not reaching middle; outer subhumeral stria complete, joined to marginal stria beyond middle; epipleurae without striae.



Propygidium setose, with coarse and dense setigerous punctures. Pygidium less densely punctate.

Prosternum finely rugose and with mid-length setae; lobe more prominent than keel and slightly emarginate (fig. 44); keel medially slightly concave, with obsolete inner prosternal striae, at same level as outer prosternal striae; outer prosternal striae more impressed than the inner. Meso-metasternal excavation deep; mesosternum with deep lateral foveae.

Metasternum with two very oblique lateral striae, well impressed, almost reaching metacoxae, inner stria lacking. Metasternum with dense setigerous granules and dense mid-length setae.

First abdominal sternite with dense setigerous granules and setae. Legs long, punctured, with mid-length setae; protibiae weakly expanded; meso- and metatibiae of similar length as elytra, slightly expanded medially (width similar 1/4 length) (fig. 62).

Aedeagus with the common morphology.

Length 1.7-1.8 mm. Width 1.4-1.5 mm.

#### Type material

The original description was based on a single specimen.

Holotype in the MNHN (accompanied by an ant) labelled: */atlantis*, Type, Théry/, /Ain Leuh, 112/, /Type/.

#### Other material examined

One specimen in the MNCN: */atlantis*, Théry/, /Azrou, Maroc, Coll. Théry/, /Co-type/, /M.N.C.N. Madrid/.

There are three specimens in the MNHN (accompanied by ants) labelled as follows: (1) /Azrou, Maroc, Coll. Théry/, /Muséum Paris, 1933, Coll. Desbordes/, /*Sternocoelis atlasicus*, Théry, (et sa fourmi)/; (2) /Azrou, Maroc, Coll. Théry/, /Coll. Dr. V. Auzat/, /*Sternocoelis atlasicus* Théry, Théry det./; (3) /Azrou, Maroc, Coll. Théry/, /Coll. Dr. V. Auzat/.

#### Distribution

*S. atlantis* is only known from the Azrou region in the Moyen-Atlas, Morocco.

#### Ecology

This species inhabits nests of several species of *Aphaenogaster* in mountainous areas.

#### *Sternocoelis setulosus* (Reitter, 1872)

(Figs 18, 45, 63 and 79)

*Hetaerius setulosus* Reitter, 1872: 179.

*Hetaerius bonnairei* Schmidt, 1888: 236 (nov. syn.).

*Sternocoelis setulosus* (Reitter): Lewis, 1888a: 149.

*Sternocoelis walkeri* Lewis, 1888a: 149 (nov. syn.).

*Sternocoelis fulvus* Lewis, 1888a: 150 (nov. syn.).

*Sternocoelis bonnairei* (Schmidt): Lewis, 1888a: 154.

#### RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex; covered by very long and erect setae and other microsetae.

Frons weakly rugose; frontal stria cariniform, evanescent on epistoma; labrum short, flat, with sparse microsetae; mandibles large, punctate and microsetose; antennal scape very enlarged, rugose and setose.

Pronotum weakly convex; anterior angles truncate, slightly elevated, and slightly produced posteriorly; sides not parallel (fig. 18); marginal stria complete; surface with small punctures mixed with other coarse setigerous punctures, denser on sides and base; anterior depression near base of second dorsal stria. Elytra densely punctate and with other setigerous punctures, almost rugose; first dorsal stria complete, second reaching middle and third shorter; outer subhumeral stria complete, joined medially to marginal stria; epipleurae somewhat rugose, without striae.

Propygidium and pygidium with dense setigerous punctures.

Prosternum with lobe and keel at slightly different levels and separated by a shallow depression (fig. 45); lobe rugose and bisinuate; keel with distinct outer stria, and inner striae fine, approaching; surface between both striae slightly punctate and microsetose; prosternal keel long. Meso-metasternal excavation deep; mesosternum setose, with deep lateral foveae. Metasternum setose, finely punctulate on disc; lateral striae well impressed, inner complete, not oblique, medial complete and oblique, and outer short; sides fossulate.

First abdominal sternite finely punctulate and microsetose.

Legs densely setose, long, weakly expanded; meso- and metacoxae medially slightly expanded (fig. 63).

Aedeagus as figure 79.

Length 1.4-1.6 mm. Width 1.0-1.3 mm.

#### Type material

The holotype of *Hetaerius setulosus* Reitter [in TM] has been studied, it is labelled: /Holotypus, *Hetaerius setulosus*, Reitter 1872/, /setulosus Typ., Oran Leder/, /Abd el Kader, Oran Leder/, /Coll. Reitter/.

Four specimens of the type series of *Hetaerius bonnairei* Schmidt have been examined. The lectotype and three paralectotypes are now designated. LECTOTYPE ♀ labelled: /Type/, /Edough/, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, /*Bonnairei* Schmidt/ [in MNHU]. PARALECTOTYPES: one ♀ labelled as the lectotype, in the same Museum; one ♀ labelled /Edough, Coll. Bonnaire/, /Edough/, /Type/, /Coll. Dr. V. Auzat/, /*Sternocoelis Bonnairei* Schm./ and one ♂ with the same labels and moreover /L'étiquette écrite de la main de Schmidt a été enlevée?? Pourquoi?/, Dr. Auzat/ [both in MNHN].

Five specimens of the type series of *Sternocoelis walkeri* Lewis have been examined. The lectotype and four paralectotypes are now designated. LECTOTYPE labelled: /Type/, /Maison Carrée/, /*Sternocoelis walkeri* Lewis, Type/, /8.3.84/, /G. Lewis Coll., B.M. 1926-369/ [in NHML]. PARALECTOTYPES [the three first specimens in NHML and the fourth in MNHU] labelled: (1) /Mahadid, Algeria/ and the same last label; (2) /Dj. Mahadid, E. Simon/ and the same last label; (3) /8.3.84/, /Walker/ and the same last label; (4) /Type/, /Alger, Lewis/, /*Hetaerius walkeri*, Type Lewis/, /Zool. Mus. Berlin/.

Twenty-eight specimens of the type series of *Sternocoelis fulvus* Lewis have been examined. The lectotype and paralectotypes are now designated. LECTOTYPE labelled: /Type/, /H. Rirha, Algeria, Lewis/, /G. Lewis Coll., B.M. 1926-369/ [in NHML]. PARALECTOTYPES, one specimen of the MNHN labelled /Hamman Rirha (Lewis)/, /Type/, /Coll. Bonnaire/, /*Sternocoelis fulvus* Lewis/, /Coll. Dr. V. Auzat/, /*Sternocoelis fulvus* Lewis/, the remaining specimens are deposited in the NHML and labelled as follows: eighteen specimens like the lectotype; two specimens /Hamman Rirha (Lewis), 23.2.88/, /G. Lewis Coll., B.M. 1926-369/;

five specimens /Hamman Rirha, 17.4.94/, /*fulvus*/ and the same last label: one specimen /Hamman Rirha, 26.2.88/, /Algeria/, /Fry Coll. 1905/, /*Sternocoelis fulvus* Lew./.

#### Other material examined

Ten specimens of the DEI labelled as follows: (1, 2 and 3) /Cirta, Lewis, 1894/, /Coll. Kraatz/, /*Sternocoelis bonnairei* Sch./, /Bickhardt det./; (4 and 5) /Blidah, Algier/, /*Sternocoelis fulvus* Lew./ and the same two last labels; (6 and 7) /Oran/ and the same two last labels; (8, 9 and 10) /Hamman Rirha, Lewis, 1888/, /*Sternocoelis bonnairei* Lew./.

Fourteen specimens of the MHNG labelled as follows: (1, 2 and 3) /*Sternocoelis setulosus* Reitt./, /Bou Berak près Dellys, Algérie/; (4 and 5) /Bou Berak, Kabilie, L. Puel/, /*E. setulosus*/; (6 and 7) /Thlemcen/, /Daya/, /*setulosus*/; (8) /Terni, 9.IV/, /*Sternocoelis setulosus* Rtt. bei *Aph. testaceopilosa*/, /Coll. A. Forel/; (9 and 10) /Bougie (Puel)/; (11 and 12) /Algérie: Gde Kabylie, 9 km E Yakouren, 930 m, 13.V.1988, Besuchet, Löbl, Burkh./, /*Sternocoelis* sp. 2, det. S. Mazur/; (13 and 14) /Tunisie, Belg. près Cap Negro, 5.IV.62, Cl. Besuchet/, /*Sternocoelis* sp., det. S. Mazur/.

Fifty-two specimens of the MNHN labelled as follows: (1) /Hamman Rirha/, /*fulvus*/, /Coll. Dr. V. Auzat/, /*Sternocoelis fulvus* Lewis/; (2) /Souk-Ahras, 16-4-92/, /Muséum Paris, 1933, Coll. Desbordes/, /*Bonnairei*, Coll. Bickhardt 88/; (3) /Medjez Amar, Algérie, L. Clouet des Pesrouches/, /*Sternocoelis bonnairei* Coll. Théry/; (4 and 5) /Hamman Rirha/, /*St. fulvus* Lew., Lewis 99/; (6) /Tisourda, 11 juin 1916/; (7) /Babor (Sad.), 12 juin 1912/; (8) /*Sternocoelis setulosus*, Juin 88/, /Reitter, Dayet/, /Muséum Paris, Coll. de Marseul, 1890/; (9) /Blida (Algérie), L. Bleuse/, /*Sternocoelis setulosus* Reitter/; (10-13) /Bou Berak près Dellys, Algérie/, /Coll. V. Auzat/, /*Sternocoelis Bonnairei* Schm./; (14) /Mt. Babor, Algérie, Coll. Théry, *Sternocoelis setulosus*/; (15) /St. Charles, SO du lac, 21 Mars 1894/, /*St. Bonnairei* Schmidt/; (16) /Coll. Théry/, /Bugeaud, L. Clouet des Pesrouches, Medjez Amar, Algérie/, /Coll. V. Auzat/, /*Sternocoelis Bonnairei* Schm./; (17) /El Milia, avril 1901, de Vauloger/, /*Sternocoelis Bonnairei* Schm./; (18) /Thlemcen, Coll. Bonnaire/, /*Sternocoelis setulosus*/; (19) /Saïda, Coll. Bonnaire/, /*Sternocoelis setulosus* Rtt./; (20) /Ravin de St. André de Mers-el-Kébir, 12-XII-59, J. Barbier/, /Dans fourmière d'*Aphaenogaster testaceopilosa*/, /*Sternocoelis setulosus* Rtt./; (21-25) /Daya, Coll. Grouvelle/, /Coll. Dr. V. Auzat/, /*Sternocoelis setulosus* Rtt./; (26-32) /Dj. Babor, 5.1901, Dr. Vauloger/, /*Sternocoelis walkeri* Lew./; (33-46) /Dj. Babor, 5.1901, A. Vauloger, Théry/; (47) /Tenet el Had, de Vauloger/; (48) /Mt. Edough, Algérie, A. Théry/, /*Bonnairei*/; (49) /Col des Oliviers, Algérie/, /Coll. Théry/; (50) /Oued Cher, L. Clouet des Pesrouches à Medjez Amar, Algérie/; (51-52) /Algeria, Lewis/, /Muséum Paris, 1933, Coll. Desbordes/, /*Sternocoelis fulvus* Lewis/.

Thirteen specimens of the MNHU labelled as follows: (1) /Oran, Lewis, 22.3.88/, /compared with Type, 8.6.88/, /*Hetaerius setulosus* Reitter/, /Zool. Mus. Berlin/ (all the specimens with the same last label); (2) /Oran/; (3) /Daya, Bedel/, /Coll. J. Schmidt/, /*setulosus* Reitter/; (4 and 5) /Algier, Desbr./; (6) /Hamman/; (7) /Tenet el H., Bedel/; (8) /Cirta, 2.5.94/, /*S. bonnairei* Sch./; (9) /Medjez Amar, Algérie, L. Clouet des Pesrouches/; (10) /Souk-Ahras, 10.4.92/, /*S. bonnairei* Sch. ??/; (11) /Constantine, G. Lewis, 19.3.92/; (12) /Bone, 1.4.92/, /*S. bonnairei* Schm./; (13) /Hamman Rirha, 1888/, /*Hetaerius fulvus* Lewis/.

Twenty-four specimens of the NHML labelled as follows: (1-5) /Blida, Lewis, 19.3.91/, /G. Lewis Coll., B.M. 1926-369/ (all the specimens whis this label); (6 and 7) /Blida, 29.4.92/, /*S. fulvus* Lewis/; (8-15) /Blida, 28.4.94/; (16) /Blida Forest, 4.5.92/, /*Walkerii*/; (17) /Blida, 19.3.91/; (18) /Bone, 1.4.92/, /*S. Bonnairei* Sch./; (19-21) /Bône/, /*Sternocoelis pectoralis*/; (22-24) /Mt. Babor, Algérie, Coll. Théry/.

Three specimens of the NHMW labelled as follows: (1 and 2) /Medjez Amar, Algérie, L. Clouet des Pesrouches/, /*Sternocoelis Bonnairei* Schm./; (3) /Bou Berak, Kabylie, L. Puel/, /*comosellus*, det. J. Müller/.

Fourteen specimens of the TM and labelled: (1) /Col des Oliviers, 17.3.1894/, /*Sternocoelis punctulatus* Lewis, Coll. Reitter/; (2) /St. Charles, SO du lac, 21 Mars 1894/, /*Sternocoelis punctulatus* Lewis, Coll. Reitter/; (3, 4 and 5) /Chanzy 1890, de Vauloger/, /*Sternoc. setulosus* Reitt., Coll. Reitter/; (6, 7 and 8) /Medjez Amar, Algérie, L. Clouet des Pesrouches/, /*Sternoc. Bonnairei* Schm., Coll. Reitter/; (9, 10, 11 and 12) /Hamman Rirha,

Algeria/, *Sternoc. fulvus* Lewis, Coll. Reitter; (13 and 14) /Algeria/, *Sternocoelis setulosus* Reitt., det. J. Frivaldszky/, *setulosus* Rtt., det. Théron/.

Thirty-five specimens in the TY, from 31 of them were labelled /Bou Berak près Dellys, Algérie/, *Sternocoelis setulosus*/ and other four specimens labelled /Bougie, L. Coutazar/.

#### Distribution

*S. setulosus* ranges throughout northern Algeria and Tunisia.

#### Ecology

This species exists in mountainous areas and is active in winter and spring. It inhabits nests of *Aphaenogaster depilis* Santschi and *A. afra* Santschi.

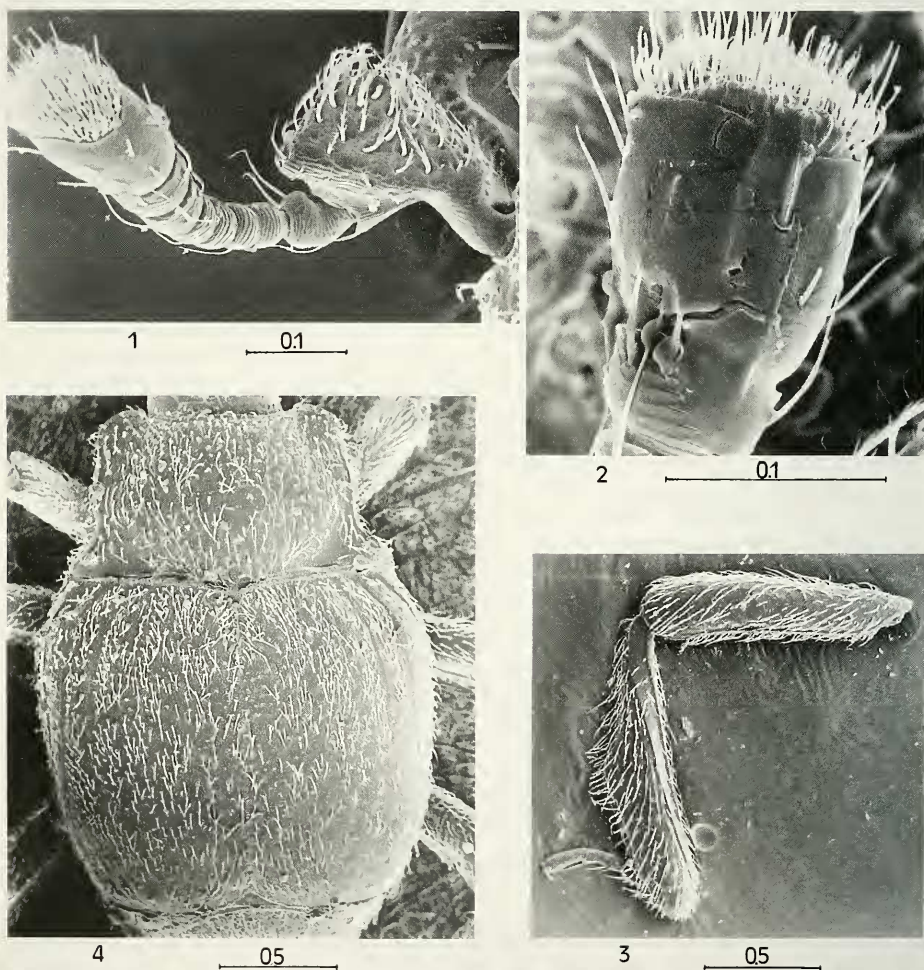


FIG. 87

*Sternocoelis hispanus* (Rosenhauer) - 1. Left antenna in dorsal view; 2. Antennal club in dorsal view; 3. Outer side of midleg; 4. Upper side of body. Scale in mm.

***Sternocoelis hispanus* (Rosenhauer, 1856)**

(Figs 19, 46, 64, 80 and 87)

*Hetaerius hispanus* Rosenhauer, 1856: 89.*Sternocoelis hispanus* (Rosenhauser); Lewis, 1888a: 148.*Haeterius incisus* var. *gili* Escalera, 1929: 376 (synonymized by Yélamos, 1993: 160).

## RE-DESCRIPTION

Colour light brown, shiny; body weakly convex; covered with two types of yellow setae, one long and erect, and the other shorter (fig. 87, 4).

Frons rugose; frontal stria cariniform and irregular, evanescent on epistoma; labrum flat and truncate; mandibles large, with dense setae; antennal scape enlarged (fig. 87, 1 and 2).

Pronotum convex, with anterior angles slightly elevated; posterior angles very produced (fig. 19), with shallow anterior impression near base of second dorsal stria; sides parallel, with marginal stria interrupted next to anterior angles; surface with setigerous pores, larger and denser on apical end. Elytra strongly expanded, convex; covered with indistinct microscopic punctules, and irregular setigerous pores and granules; first dorsal stria complete, second apically shortened and third reaching middle; outer subhumeral stria surpassing middle and marginal stria strong and complete; epipleurae rugose, without striae.

Propygidium and pygidium with dense setigerous pores.

Prosternum rugose and setose; keel broad and flat, except near lobe, where there is a wide depression, as well as on base; base slightly sloped toward mesosternum (fig. 46); inner striae weakly prominent, subparallel; prosternal lobe deflexed; outer striae short and fine. Meso-metasternal excavation very deep; mesosternum with short and dense setae; sides fossulate. Metasternum long and pubescent, with granules and punctures on disc; sides fossulate; lateral striae obsolete, only distinct two oblique striae, reaching middle.

First abdominal sternite with setigerous pores; sides with coarse punctures.

Legs very long; femora and tibiae of same length; proportion between metatibia and body length 0.56-0.58; protibiae slightly expanded at apical half; mesotibiae medially strongly expanded (fig. 87, 3); metatibiae expanded at apical part, nearly 1/4 total length metatibia (fig. 64); densely setose and slightly rugose.

Aedeagus as figure 80.

Length 1.5-2.1 mm. Width 1.2-1.7 mm.

## Type material

Two specimens of the type series of *Hetaerius hispanus* Rosenhauer have been examined, deposited in the DEI, being now designated as lectotype and paralectotype. The remaining specimens in the St. Petersburg Zoological Institute were unavailable for study. They should be considered paralectotypes. LECTOTYPE labelled: */hispanus*, S. de Ronda, Andalus (Rosh.), bei *Aphenogaster senilis* Mayr./, /Coll. L. v. Heyden. DEI Eberswalde/. /Syntypus/. PARALECTOTYPE labelled: /Andalus, Rosenhr./, /Coll. L. v. Heyden, DEI Eberswalde/.

The lectotype and nine paralectotypes of *Haeterius incisus* var. *gili* Escalera have been examined [all in MNCN]. Lectotype ♀ labelled: /Candeleda, 30.3.1929/, */St. incisus* var. *gili* Esc./, Paralectotypes: 4 ♀♀ and 4 ♂♂ labelled like the lectotype; a ♀ /Dehesa Rincón, Candeleda, 30.3.1929/.

### Other material examined

Nine specimens of the DEI labelled as follows: (1) /Alhambra/, /Coll. Kraatz/, /Bickhardt det./, /*Sternocoelis hispanus*/; (2 and 3) /Escorial, Lewis, 28.4.88/, moreover the second and the third labels; (4 and 5) /Madrid/, moreover the second and the third labels; (6) /Cordoba/, moreover the second and the third labels; (7 and 8) /*Haeterius hispanicus*/, /Portugal/, /Coll. Stierlin/; (9) /Hispanus, Hispania, Merkl/, /*Aphaenog. testaceopil.*/, /Coll. L. v. Heyden, DEI Eberswalde/.

Four specimens of the EEZA labelled: /Nava de S. Pedro, S. Cazorla, Jaén, A. Cobos leg./, /V. 1962/.

Ten specimens of the MHNG labelled as follows: (1-9) /Maroc-Rif, Bab Besen, près Mt. Tidiguin, (1150 m) 23.IV.60, Cl. Besuchet/, /*Sternocoelis* sp., det. S. Mazur/; (10) /*hispanicus*, Cintra, Lewis/.

Thirty specimens of the MNCN labelled as follows: (1-9) /Tizi Taka, Beni Seddat, Rif, VI-1930, Exp. C. Bolivar/; (10-13) /Imasinen, Beni Seddat, Rif, VI-1930, Exp. C. Bolivar/; (14-20) /Iguermalen, Beni Mesdui, VI-1932, M. Escalera/; (21) /Iguermalen, Targuist, Rif, VI-1930, Exp. C. Bolivar/; (22) /Zoco Telata, Ketama, Rif, VI-1930, Exp. C. Bolivar/; (23-28) /Bab Chiquer, Ketama, Rif, VI-1932, M. Escalera/; (29-30) /Candeleda, 30.3.1929/.

Thirty-one specimens of the MNHN labelled as follows: (1-3) /Cintra, 12-4-86/, /*Sternocoelis hispanicus*/; (4) /Andalousie/; (5-6) /Alcala, 3-92/, /*Sternocoelis hispanicus* Rosh./; (7) /Montarco (Madrid)/, /Coll. Dr. V. Auzat/, /*Sternocoelis hispanus* Rosh./; (8) /Madrid, ex Escalera/ and the same two last labels; (9) /Escorial, Lewis, 28.4.88/, /Coll. Bonnaire/ and the two last labels; (10) /Lusitania merid., Coll. Bonnaire/ and the two last labels; (11) /Pozuelo, de la Fuente/ and the two last labels; (12) /Alcala 91, Martinez/, /*Hetaerius hispanus*/, /SAMML Dr. Daniel/ and the same last labels; (13) /Alcala, Andalousie/, /*hispanus* Rosh./; (14) /Pozuelo de Calatrava (Espagne)/, /*St. hispanus*/; (15) /Cintra, Lewis/; (16) /Candeleda, 20-3-1929/, /*S. hispanus* Rosh./; (17) /*Hetaerius hispanus*, mars 22.91, Lewis 88/, /Madrid, 22-3-54/, /Muséum Paris, Coll. de Marseul, 2842-90/; (18-19) /Cintra, Lewis, 8-4-86/, /Muséum Paris, Coll. de Marseul, 2842-90/; (21-22) /Cintra, Lewis, april 84/, /*Hetaerius hispanus*, Cintra, 1.4.86, Lewis 86/; (23-28) /Muséum Paris, Coll. de Marseul, 2842-90/, /*Hetaerius hispanicus* R. Cintra (Lewis) 1886/; (29) /*Hetaerius hispanicus*, Tanger, Juin 81/, /Muséum Paris, Coll. de Marseul, 1890/, /Tanger/, /Coll. Camilie Van Volxem/; (30) /Cintra, Coll. Bickhardt/, /Muséum Paris, 1933, Coll. Desbordes/, /*hispanus*/; (31) /Madrid, Lewis/, /*Sternocoelis hispanicus*/ and the same last label.

Six specimens in the NHMW labelled as follows: (1) /*hispanus* Rosh., Madrid, Bauduer/, /c. Epplsh. Steind. d./, /*hispanus*/; (2) /Lusitan. Reitter 1888/; (3) /Lusitania/, /collection Kaufmann/, /*Sternocoelis hispanus*, det. J. Müller/; (4) /Sartorius 1876/; (5) /Hispania/, /*hispanus* Ros./; (6) /*Sternocoelis hispanus*/.

Five specimens of the TM labelled as follows: (1-2) /Lusitania/, /Cintra, Lewis, 3.4.86, Lusitania/, /*Sternoc. hispanus*, Rosenh., Coll. Reitter/; (3) /Hispania, Madrid/, /*Sternoc. hispanus*, Rosenh., Coll. Reitter/; (4-5) /Portugal Merid./, /*Hetaerius hispanus*, det. J. Frivaldsky/, /*hispanus* Rosh., det. Théron/.

Fourteen specimens of the TY labelled as follows: (1-3) /Villapalacios, (Albacete), 21.4.84, T. Yélamos leg./; (4-5) /Pto. Pocos, Albacete, 21.4.84, T. Yélamos leg./; (6) /Provinz, Madrid/, /Hispania, Reitter/; (7) /Cintra, (Lewis) 1886/, /*Hetaerius hispanicus*/; (8) /*Heterius hispanus*, Madrid/; (9-13) /Cand., 9.4/; (14) /Candeleda, 20.4.1930/.

### Distribution

*S. hispanus* occurs in central and southern Portugal and Spain, as well as in the Rif region in the north of Morocco.

### Ecology

This species is the most common *Sternocoelis* in the Iberian Peninsula. It inhabits nests of *Aphaenogaster senilis* Mayr. It lives at low and middle altitudes.

**Sternocoelis arachnoides** (Fairmaire, 1877) (Figs 20, 27, 47, 55, 65, 81 and 88)

*Hetaerius arachnoides* Fairmaire, 1877: 98.

*Sternocoelis arachnoides* (Fairmaire); Lewis, 1888a: 150.

*Sternocoelis araneoides* (Fairmaire); Kryzhanovskij & Reichardt, 1976: 410 (*lapsus calami*).

## RE-DESCRIPTION

Colour light brown, shiny; body convex; sparsely covered with very long, yellow setae. Habitus as figure 88.

Frons rugose and setose; frontal stria cariniform, irregular and finer on epistoma; labrum short and truncate; mandibles large, with dense microsetae; antennal scape very large and microsetose.

Pronotum narrow and weakly convex; anterior angles produced, slightly elevated; posterior angles strongly produced (fig. 20); sides bisinuate, subparallel, with marginal stria interrupted near anterior angles; apical third covered with punctures and setigerous granules, sparser on rest, smooth; shallow depression near base third dorsal stria. Elytra weakly convex, subparallel, with coarse and sparse setigerous punctures; first dorsal stria complete, second and third basal; outer subhumeral stria well impressed, complete, joined to marginal stria medially; epipleurae slightly rugose, microsetose, with a long irregular stria (fig. 27).

Propygidium and pygidium sparsely covered with setigerous pores of different sizes.

Prosternum rugose and setose; keel convex over its entire length, basally sloping towards mesosternum and apically towards prosternal lobe; inner striae strong, slightly prominent, outer striae slightly impressed; prosternal lobe bisinuate, weakly produced and separated from keel by a shallow and wide depression (fig. 47). Mesometasternal excavation very deep; mesosternum with oblique deep depressions near to mesocoxae, extended through deep foveae internally. Metasternum elongate, with nearly smooth surface; sides covered with dense microsetae; dorsal striae fine, of similar length and just surpassing mesocoxae.

First abdominal sternite with dense setigerous pores and microsetae on disc, denser on sides.

Legs very long (fig. 65), with femora and tibiae of same length (proportion between length metatibia and total length body 0.73-0.75); tibiae somewhat expanded, densely setose.

Aedeagus as figure 81.

Length 1.5-1.6 mm. Width 1.1-1.2 mm.

## Material examined

The type series was not found in the Fairmaire collection (MNHN).

Eight specimens were seen of the DEI with the following labels: (1-2) /Tanger, Rolph/, /Peyerimhoff det./, /*Sternocoelis arachnoides* Fairm./; (3-4) /Tanger, Lewis/, /Coll. Kraatz/, /Bickhardt det./; (5) /Marocco, Coll. O. Leonhard/, /Coll. Leonhard/, /*Hetaerius arachnoides* Fairm./; (6-7) /Maroc/, /Coll. Stierlin/, /*H. arachnoides* Fairm./; (8) /Tanger, Desbroch./, /*arachnoides* Fairm./, /Coll. L. v. Heyden, DEI Eberswalde/.

Nine specimens of the MHNG: (1) /Maroc/, /*Sternocoelis arachnoides*, 1974, det. S. Mazur/; (2-5) /Maroc, Beccard/ and the same last label; (6-7) /Maroc, Vaucher/ and the same last label; (8) /P. de Borre/, /Maroc/; (9) /*arachnoides*. Frm., Tanger, Janvier/.

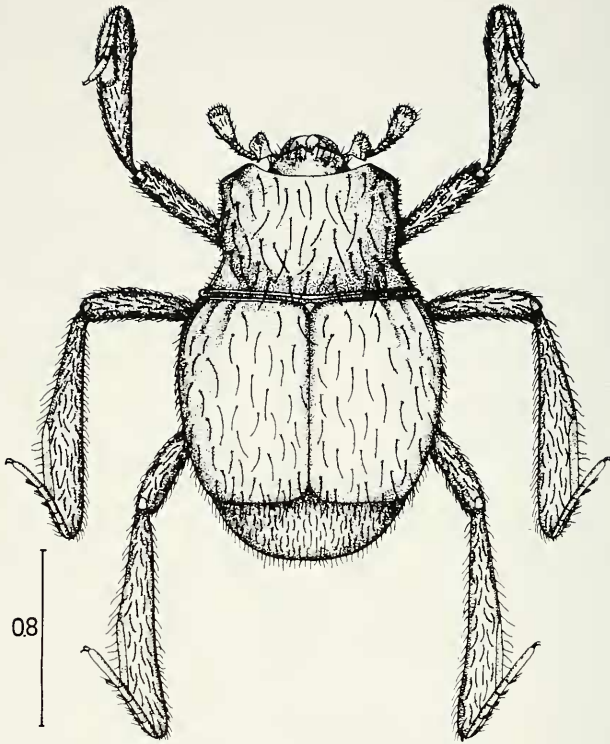


FIG. 88

Dorsal habitus of *Sternocoelis arachnoides* (Fairmaire). Scale in mm.

Five specimens of the MNCN: (1-2) /Larache, M. Escalera/; (3-5) /Larache, 5.1915/.

Twenty-two specimens of the MNHN: (1-3) /Tanger, ex Escalera/, /Coll. Dr. V. Auzat/, /*Sternocoelis Arachnoides* (Fair.)/; (4-5) /Tangier, Lewis, 2.4.88/, /Coll. Bonnaire/ and the same two last labels; (6-7) /Larache (Maroc), Escalera/ and the same two last labels; (8) /Maroc, H. Vaucher/, /Collection E. de St. Albin/, /*Sternoscoelis arachnoides* Fairm./; (9) /1907, Tanger/, /Maroc, ex Musæo, H. Vaucher, 1908/, /*Hetaerius arachnoides* Frm./; (10) /Maroc, Olcese/; (11) /Andalousie/; (12) /4.95, Tanger/; (13) /Tangier, Lewis, 2.4.88/; (14-17) /Tangier, Lewis, 7-4-88/, /*Sternocoelis arachnoides* Lew. 88/, /Muséum Paris, Coll. de Marseul, 1890/; (18-20) /Maroc, E. Tisson/, /*arachnoides* (Peyer. det. 1909)/ and the same last label; (21) /Morocco,



Lewis/, /Muséum Paris 1933, Coll. Desbordes/, /*Sternocoelis arachnoides*; (22) /Coll. Fleutiaux/, /*arachnoides*/, /Muséum Paris 1933, coll. Desbordes/.

Three specimens of the NHMW: (1) /3.96, Tanger/, /Collect. Hauser/, /*H. arachnoides* Frm./; (2-3) /Tanger, Herrmann/.

Four specimens of the TM: (1-2) /Tangier, Lewis/, /*Sternoc. arachnoides* Fairm., Coll. Reitter/; (3-4) /Marokko, Tanger/, /*Sternoc. arachnoides* Fairm., Coll. Reitter/.

Four specimens of the TY: (1-4) /Tanger, 4.1904/, /Tanger, Lewis/, /*Sternocoelis arachnoides* Fairm/.

## Distribution

*S. arachnoides* occurs mainly in the northern Morocco (Tangier and Larache), but there are several specimens labelled "Andalusia" and "Spain", without precise localities.

## Ecology

This species inhabits nests of *Aphaenogaster sardoa* Mayr and *A. strioloides* Forel and is active in winter and spring. It occurs at lower elevations.

## *Sternocoelis slaoui* Théry, 1921

(Figs 21, 48, 56 and 66)

*Sternocoelis slaoui* Théry, 1921: 18.

*Sternocoelis cancriformis* Escalera, 1921: 126 (syn. nov.).

## RE-DESCRIPTION

Colour reddish brown, shiny; body weakly convex, broadly oval; with long yellow, setae and microsetae.

Frons with scarce setigerous pores; frontal stria cariniform, irregular and evanescent on epistoma; labrum flat, truncate; mandibles large, convex and setose; antennal scape very enlarged and setose.

Pronotum wide and weakly convex; anterior angles expanded, slightly elevated; posterior angles weakly produced (fig. 21); sides of pronotum with marginal stria interrupted near posterior angles; surface covered with setigerous granules; base of pronotum with deep depression near base of third dorsal stria. Elytra weakly convex; sides subparallel and with sparse setigerous granules and pores; dorsal striae fine, very curved outward, first complete, second reaching middle and third basal; outer subhumeral stria complete, not united to marginal stria, only reaching middle; epipleurae rugose and without striae.

Propygidium and pygidium with sparse, coarse setigerous pores.

Prosternum with keel longitudinally convex over its entire length; base sloping toward mesosternum; also sloping apically within a wide depression between lobe and keel (fig. 48); inner prosternal striae divergent, somewhat prominent, with surface between them nearly smooth and with setae on anterior end; outer prosternal striae well impressed; prosternal lobe rugose and deflexed. Meso-metasternal excavation very deep; mesosternum almost vertical, with deep impression on both sides near to mesocoxae, and deep foveae inside body. Metasternum long, finely punctulate on

disc, sides with coarse setigerous punctures; inner lateral stria well impressed and nearly complete, medial stria less impressed and somewhat shorter; outer stria very fine and short.

First abdominal sternite with disc convex and setigerous granules.

Legs very long (figs 56 and 66), with femora and tibiae of same length (length metatibia/total length body = 0.63-0.65); tibiae slightly expanded, punctate and setose.

Aedeagus like *S. arachnoides*.

Length 1.4-1.5 mm. Width 1.1-1.2 mm.

#### Type material

The holotype of *Sternocoelis slaoui* Théry [in MNHN] is labelled as follows: /Kil 13, 3-3-1920/, /Route de Salé à Kenitra/, /*Sternocoelis slaoui* Théry/, /Type/ (accompanied by an ant).

The type series of *Sternocoelis cancriformis* Escalera were also seen. The lectotype and ten paralectotypes are now designated. LECTOTYPE ♂ labelled: /Larache, 5.1915/, /sintipo/ [in MNCN]. PARALECTOTYPES, three specimens in MNCN: one ♂ labelled like the lectotype: 2 ♀♀ /Larache, M. Escalera/, /Sintipo/; seven specimens in MNHN: /Larache/, /Paratype/, /*Sternocoelis cancriformis* Esc./; /Larache, M. Escalera/, /*cancriformis*, Cotype, Esc./; /Larache/, /Type/, /Type qui a servi à Escalera pour faire son dessin/, /*Sternocoelis cancriformis*, type Esc./, /Coll. Dr. V. Auzat/ and four specimens labelled /Larache/, /Maroc, ex Escalera/, /Coll. Dr. V. Auzat/, /Paratype/, /*Sternocoelis cancriformis* Es./.

#### Distribution

*S. slaoui* is only known from northern Morocco (Larache and Salé).

#### Ecology

This species occurs at lower elevations and inhabits nests of *Aphaenogaster sardoa* Mayr and *A. strioloides* Forel.

#### *Sternocoelis comosellus* (Fairmaire, 1883)

(Figs. 22, 49, 67 and 82)

*Hetaerius comosellus* Fairmaire, 1883: 42.

*Sternocoelis comosellus* (Fairmaire): Lewis, 1888a: 148.

#### RE-DESCRIPTION

Colour reddish brown, shiny; body convex; with long and short yellow setae.

Frons rugose; frontal stria cariniform, weakly prominent; labrum short, flat and truncate; mandibles large, convex, rugose and with long setae; antennal scape very enlarged, rugose and setose.

Pronotum with anterior angles truncate, not elevated, and posterior angles very produced (fig. 22); sides parallel, rounded and without marginal stria; surface slightly convex and with coarse, dense setigerous punctures, mixed with other punctures, mainly on sides and anterior part. Elytra lacking distinct striae; weakly convex and with mixture of coarse and dense setigerous punctures; epipleurae rugose and without striae.

Propygidium and pygidium with dense setigerous punctures.

Prosternum with lobe deeply emarginate, divided into two parts and forming an obtuse angle with keel (fig. 49); prosternal keel wide, with outer and inner striae well impressed, outer stria fine; inner stria basally recurved towards mesosternum and diverging at apical half. Meso-metasternal excavation shallow; mesosternum without lateral foveae, but with fine oblique impression. Metasternum with disc covered with fine and sparse punctures, and short, fine setae; sides with sparse setigerous punctures; inner lateral stria very short; two outer oblique striae and reaching middle.

First abdominal sternite with small, sparse setigerous punctures, and setae.

Legs very long, not expanded, and with long setae (fig. 67).

Aedeagus as figure 82.

Length 1.3-1.5 mm. Width 1.1-1.2 mm.

#### Type material

The holotype [in MNHN] has been studied, labelled as follows: /Philipv./, /Type/, /Coll. Bonnaire/, /Coll. Dr. V. Auzat/ *Sternocoelis comosellus* Type Fairm./.

#### Other material examined

Six specimens of the DEI labelled: (1) /Constantine/, /Coll. Kraatz/, /Bickhardt det./, *Sternocoelis comosellus* Fairm./; (2) /Medjez Amar, Algérie, L. Clouet des Pesrouches/, /Bickhardt det./; four specimens /2-94/, /Mamar/, *comosellus*, Algérie, Théry/, /Coll. L. v. Heyden, DEI Eberswalde/.

Two specimens of the MHNG, both bearing the labels /Constantine/, /Walkeri Lewis/.

Nineteen specimens of the MNHN labelled: (1 and 2) /2.94/, /Mamar/, /Collection A. Grouvelle/, /Coll. Dr. V. Auzat/, *Sternocoelis comosellus* Frm./; (3, 4 and 5) /Constantine 92, février, Coll. Hénon/, /Coll. Dr. V. Auzat/, *Sternocoelis comosellus* Frm./; (6) /Constantine/, /Walkeri Lew./, /Coll. Dr. V. Auzat/, *Sternocoelis comosellus* Frm./; (7) *Sternocoelis fulvus* Lew. 88/, /H. Rirha Lewis, 27.2.88/, /Muséum Paris, Coll. de Marseul 1890/, *Hetaerius comosellus* Fairm./; (8) /Constantine, Coll. Théry/, /Muséum Paris, 1933, Coll. Desbordes/, *Sternocoelis comosellus*/; (9, 10, 11, 12, 13, 14 and 15) /Medjez-Amar, Algérie, L. Clouet des Pesrouches/; (16) *comosellus* Frm., A. Théry, 3r.1901, Medjez-Amar, 2.44/, *Comosellus*, Cortain/; (17) /Dfoman-Cher/; (16) /Dienard, Algérie, Coll. Théry/; (19) /Constantine, Algérie, Coll. Théry/.

Five specimens of the MNHU labelled: three specimens /D. Ouach, Alger/, /Zool. Mus. Berlin/; one specimen /Constantine Alger/, *Hetaerius comosellus* Fairm./, /Coll. J. Schmidt/, /Zool. Mus. Berlin/, *comosellus* Fairm./; one specimen /M. Amar/, *comosellus*, /Zool. Mus. Berlin/.

Three specimens of the NHMW all were labelled /Medjez-Amar, Algérie, L. Clouet des Pesrouches/, /Coll. Hauser/, *Bonnairei* det. J. Müller/, *Sternocoelis comosellus* Frm./.

Five specimens of the TM: three were labelled /Medjez-Amar Algérie, L. Clouet des Pesrouches/, *Sternoc. comosellus* Fairm., Coll. Reitter/; one specimen /Algeria/ and the same last label; one specimen /Alger Reitter/, *Sternocoelis comosellus*, det. J. Frivaldszky/, /J. Théron det. 1962, *Sternocoelis comosellus* Frm./.

#### Distribution

*S. comosellus* is found in Northern Algeria.

#### Ecology

This species is known to be active in winter and spring at low altitude. It inhabits nests of *Aphaenogaster canescens* Emery.

**Sternocoelis espadaleri** n. sp.

(Figs 23, 50, 68, 83 and 86)

## DIAGNOSIS

This species is similar to the related *S. comosellus* from Algeria. It differs in having a distinct dorsal striae, a marginal elytral and subhumeral striae which are cariniform, oblique lateral mesosternal foveae and deep meso-metasternal excavation.

## DESCRIPTION

Colour reddish brown, shiny; body convex; surface sparsely covered with long and short setae.

Frons wide, with dense setigerous punctures; frontal stria cariniform, reaching epistoma; labrum weakly concave and with setigerous punctures; mandibles large, convex and rugose, with long, dense setae; antennal scape strongly enlarged, rugose, densely setose; antennal club very large, pubescent; eyes large.

Pronotum with anterior angles truncate, weakly produced; posterior angles well produced (fig. 23); sides rounded, subparallel, without marginal stria; disc convex with coarse, dense setigerous punctures; sides rugose, with smaller punctures near base; small deep depression near posterior angles. Elytra very expanded, with dense setigerous punctures and short and long setae; sides rugose and more densely setose; dorsal striae very reduced, appearing as shallow impressions, the first stria more impressed, second and third only reaching middle; subhumeral, marginal and epipleural striae irregular and fine; epipleurae without striae, with coarse, dense setigerous punctures and microsculpture.

Propygidium and pygidium densely covered with setigerous punctures and setae.

Prosternal lobe deeply emarginate and deflexed; keel very wide and slightly rugose, with inner striae very separated, parallel (fig. 50), slightly cariniform, reaching apical 2/3, and outer striae well impressed and at a slightly lower level as inner striae; keel base abruptly sloping toward meso-metasternal excavation. Meso-metasternal excavation very deep; mesosternum strongly sloped, smooth, with oblique, shallow lateral foveae. Metasternum long, depressed, sparsely punctate and with scattered short setae; longitudinal metasternal stria convex at base; inner lateral stria almost reaching 2/3 length metasternum; medial stria reaching metacoxae while outer stria only reaching middle; sides with dense, irregular setigerous punctures and short setae.

First abdominal sternite with shallow transverse depression, with sparse setigerous punctures and setae.

Legs very long (fig. 68), not expanded and with dense setigerous punctures and setae; femora with a ventral groove to receive tibiae; tarsal grooves shallow, mainly on meso- and metatibiae.

Eight male abdominal segment finely sclerotized and rather wide and short; spiculum gastrale very long and Y-shaped (fig. 86); aedeagus with basal piece narrow; parameres very long, not parallel, with an apical emargination almost reaching middle (fig. 83). Female not known.

## MEASUREMENTS

Total length 1.8 mm	Maximum width 1.3 mm
Profemur length 0.9 mm	Protibia length 0.8 mm
Mesofemur length 1.0 mm	Mesotibia length 1.1 mm
Metafemur length 1.1 mm	Metatibia length 1.2 mm
Maximum length pronotum 0.7 mm	Maximum length elytra 1.1 mm
Maximum width pronotum 1.0 mm	
Minimum width pronotum 0.9 mm	
Maximum width elytra 1.3 mm	
Minimum width elytra 1.1 mm	

## Type material

Two specimens have been studied. HOLOTYPE: ♂ labelled /Maroc, 1660 m, Bou el Ghallat, près Aghbala, lg. Espadaler/, /avec *Aphaenogaster baronii* Cagn., sous chêne vert/, with an ant [in MHNG]. PARATYPUS: ♀ labelled /Djebel Irhoud, Agadir Maroc, 1800 m, 23-5-86. X. Espadaler leg./, /Bosc de cedres en nid d'*Aphaenogaster baronii*/ [in JM].

## Etymology

I have the pleasure to name this species after my friend and Colleague, ants specialist, Dr. Xavier Espadaler, as a tribute to his valuable collaboration.

## Distribution

*S. espadaleri* is only known from Aghbala (east from El-Ksiba), Moyen-Atlas, central Morocco and Djebel Irhoud (near Agadir) South-western Morocco.

## Ecology

The holotype was collected in a nest of *Aphaenogaster baronii* Cagniant together with *Thorictus* (Coleoptera, Thorictidae) on May 16, 1984 and the paratype was collected in a nest of the same ant on May 23, 1986.

*S. espadaleri* was collected in a mesic oak forest on a North-west facing slope at an elevation of 1,600 m, as well as in a cedar's forest at 1,800 m.

## SYSTEMATIC RESULTS

After the study of 792 specimens, it has become clear that a great number of synonyms has been created, mainly on account of differences in punctuation and pilosity. These characters show a high individual variability.

*Sternocoelis espadaleri* is described as a new species and 14 species are dropped into the synonymy of 26 valid species:

- S. ovalis* Lewis, 1900 syn. nov. of *S. viaticus* Lewis, 1892.
- S. mauritanicus* Lewis, 1888 syn. nov. of *S. fuscus* (Schmidt, 1888).
- S. aureopilosus* Escalera, 1921 syn. nov. of *S. fuscus* (Schmidt, 1888).
- S. variolosus* Théry, 1921 syn. nov. of *S. alluaudi* Théry, 1921.
- S. loustali* Kocher, 1956 syn. nov. of *S. alluaudi* Théry, 1921.
- S. politus* (Schmidt, 1888) syn. nov. of *S. bedeli* (Lewis, 1884).

- S. cancer* Lewis, 1888 syn. nov. of *S. bedeli* (Lewis, 1884).  
*S. exstructisternum* Lewis, 1888 syn. nov. of *S. bedeli* (Lewis, 1884).  
*S. pectoralis* Lewis, 1888 syn. nov. of *S. bedeli* (Lewis, 1884).  
*S. sedilloti* Lewis, 1889 syn. nov. of *S. bedeli* (Lewis, 1884).  
*S. boumairei* (Schmidt, 1888) syn. nov. of *S. setulosus* (Reitter, 1872).  
*S. walkeri* Lewis, 1888 syn. nov. of *S. setulosus* (Reitter, 1872).  
*S. fulvus* Lewis, 1888 syn. nov. of *S. setulosus* (Reitter, 1872).  
*S. cancriformis* Escalera, 1921 syn. nov. of *S. slaoui* Théry, 1921.

The lectotypes and paralectotypes of the 20 following taxa are designated: *Sternocoelis otini* Peyerimhoff, 1949, *S. marginalis* Normand, 1915, *S. laevidorsis* var. *major* Pic, 1905, *S. laevidorsis* var. *semiopacus* Normand, 1915, *S. viaticus* Lewis, 1892, *S. vaucheri* Lewis, 1896, *S. aureopilosus* Escalera, 1921, *S. alluaudi* Théry, 1921, *S. cancer* Lewis, 1888, *S. walkeri* Lewis, 1888, *S. fulvus* Lewis, 1888, *S. cancriformis* Escalera, 1921, *Hetaerius lewisi* Reitter, 1883, *H. pluristriatus* Fairmaire, 1877, *H. cavisternus* Marseul, 1862, *H. bedeli* Lewis, 1884, *H. politus* Schmidt, 1888, *H. boumairei* Schmidt, 1888, *H. hispanus* Rosenhauer, 1856 and *Haeterius marseulii* Brisout de Barneville, 1866.

PIC (1937) described *Sternocoelis sulcaticollis* from "environs Maroc: forêt Quer" (properly: Forêt des Zaër, south of Rabat). This species is characterized by having clearly separated and explanate the sides of pronotum. The remaining characters in the author's description are general for other *Sternocoelis* as well. The description is too imprecise to place it into the key to species without studying it. The present abode of the type is unknown. According to the morphology of sides of pronotum, it could be placed near to *S. otini*, also occurring in Morocco, and may be a synonym. *S. sulcaticollis* has not been considered in this work.

MOTSCHULSKY (1839) briefly described "un nouveau *Haeterius* qui ressemble au *quadratus* Payk., mais mon exemplaire qui vient de Sicile est velu". However the specific name is not quoted; it was included in another work issued in 1858. Therefore the last date should be considered the correct date of publication of *Sternocoelis puberulus*.

ESCALERA (1921) and THÉRY (1921) respectively described *S. cancriformis* and *S. slaoui*, both being synonyms. The work of Théry was included in volume from 1920-1921 dated 1.1.1921 and the work of Escalera was included in volume from 1921 dated 25.4.1921. Thus *S. slaoui* should be considered to have priority on *S. cancriformis*.

## PHYLOGENETIC ANALYSIS AND ZOOGEOGRAPHY

Up to now there are scarce data on the phylogeny of Histeridae. HELAVA *et al.* (1985) published an extensive study on the American Hetaeriinae. In this work they argue the hypothesis that the sister-group of the Hetaeriinae are the Exosternini.

According to HELAVA *et al.* (1985) genus *Hetaerius* Erichson, 1834 (Holarctic) and *Mroczkowskiella* Mazur, 1984 (Nearctic) together form the subgroup C3, which is

TABLE 1

Characters employed (Plesiomorphic = 0; Apomorphic = 1, 2, 3)

1. Setae of body: only with long and fine (0); long and short (1); only with short and large (2).
2. Lower part of body: smooth or finely punctate (0); with punctures well impressed and dense (1).
3. Lower part of body: without setae (0); with dense setae (1).
4. Frontal stria: not cariniform on the epistoma (0); being also cariniform on the epistoma (1).
5. Shape of pronotum: trapezoidal, with posterior angles not produced (0); subtrapezoidal, with posterior angles produced (1); sides parallel, with posterior angles produced (2).
6. Sides of pronotum: explanate, clearly separated from disc (0); medially not separated from disc (1).
7. Sides of pronotum: with marginal stria variably reduced (0); without marginal stria (1).
8. Anterior angles of pronotum: not elevated (0); elevated (1).
9. Dorsal striae: the first three complete (0); only with the 4th (1); the second and the third reduced (2); without striae (3).
10. First dorsal stria: complete (0); reduced or lacking (1).
11. Elytral striae: indicated by rows of long setae (0); not indicated by rows of long setae (1).
12. Marginal elytral and outer subhumeral striae: cariniform (0); lacking (1).
13. Epipleural elytral striae: distinct, well impressed (0); reduced (1); lacking (2).
14. Inner prosternal striae: joined or almost joined in front (0); sinuate (1); parallel or apically divergent (2).
15. Inner prosternal striae: fine but complete (0); obsolete, indistinct (1); cariniform (2); with lateral projections (3).
16. Prosternal lobe: slightly sinuate or with medial depression (0); deeply emarginate (2); neither sinuate nor emarginate (1).
17. Prosternal lobe and keel: at same or similar level (0); at very different level (lobe either at lower or at upper level) (1).
18. Prosternal lobe and keel: without depression between them (0); with a shallow depression (1); with deep depression (2).
19. Prosternal base: equally situated than the rest of keel (0); depressed, sloped in relation to keel, directed toward mesosternum (1).
20. Prosternal keel: flat or somewhat convex (0); strongly convex (1).
21. Outer prosternal striae: variably distinct (0); indistinct or very reduced (1).
22. Meso-metasternal excavation: shallow (0); deep, situated on the meso-metasternal suture (1); very deep, on all the metasternal disc (2).
23. Lateral mesosternal foveae: without (0); oblique (1); inside of body (2).
24. Inner lateral stria of metasternum: complete (0), reduced (1); indistinct (2).
25. Meso- and metatibiae: short and enlarged (0); long and weakly enlarged (1); very long and not enlarged (2).

not defined by a synapomorphy. This author considers these taxa to be monophyletic because they share apomorphic character states with the Palearctic genus *Satrapes* Schmidt, 1885, not studied by Helava.

After studying the Palearctic genera of Hetaeriinae, it is assumed the hypothesis that the sister group of *Sternocoelis* is the genus *Hetaerius* (see figure 69). In the Mediterranean area occur three species of *Hetaerius*: *H. ferrugineus* (Olivier, 1789) (western Palearctic), *H. ottomanus* Mazur, 1981 (Turkey) and *H. plicicollis* Fairmaire, 1876 (Algeria), with a lot of north American species.

TABLE 2

Character state matrix for taxa and characters (Plesiomorphic = 0; Apomorphic = 1, 2, 3).

Taxa	Character number																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
outgroup	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>S. viaticus</i>	0	0	0	0	1	1	1	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0
<i>S. marseulii</i>	0	0	0	1	1	1	0	1	2	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0
<i>S. vaucheri</i>	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0	1	0	0	0	0	1	0	0	2	0
<i>S. lewisi</i>	2	1	0	0	0	1	0	1	2	0	1	0	2	0	0	1	0	0	0	0	0	0	1	0	1
<i>S. diversepunctatus</i>	2	1	0	0	0	1	0	1	2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
<i>S. puberulus</i>	2	0	0	0	0	1	0	0	2	0	1	0	1	2	1	0	1	0	0	0	1	0	0	1	0
<i>S. merklii</i>	2	1	0	1	0	1	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0
<i>S. otini</i>	2	0	0	0	0	0	0	0	2	0	1	0	2	1	1	1	1	1	0	0	0	1	0	0	0
<i>S. marginalis</i>	1	0	0	0	0	0	0	2	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	1	0
<i>S. laevidorsis</i>	2	0	0	1	0	0	0	2	1	1	0	1	1	1	1	0	1	1	0	1	1	0	1	0	0
<i>S. grandis</i>	2	1	0	1	0	0	0	0	2	1	1	0	0	2	1	0	1	0	0	1	1	1	1	0	0
<i>S. robustus</i>	2	1	1	1	0	0	0	0	2	0	1	0	1	1	1	0	0	1	0	1	1	1	1	0	1
<i>S. fuscus</i>	2	1	0	1	1	1	0	0	2	0	1	0	1	1	2	1	1	1	0	0	0	2	0	1	0
<i>S. incisus</i>	2	0	0	1	1	1	0	1	2	0	1	0	1	1	3	1	0	2	0	0	0	2	1	0	0
<i>S. alluaudi</i>	2	1	0	1	1	0	1	2	0	1	0	2	1	3	0	0	2	0	0	0	2	1	1	0	0
<i>S. acutangulus</i>	2	0	0	1	2	1	0	1	2	0	1	0	2	1	3	0	0	2	0	0	0	2	1	1	0
<i>S. pluristriatus</i>	2	0	0	1	0	1	0	1	1	0	1	0	2	1	2	0	0	0	0	0	0	2	1	1	0
<i>S. bedeli</i>	2	0	0	1	1	1	0	1	2	0	1	0	2	1	2	0	0	0	0	0	0	2	1	1	0
<i>S. punctulatus</i>	0	0	0	1	1	1	0	1	2	0	0	0	2	1	2	0	0	0	0	0	0	2	1	1	0
<i>S. atlantis</i>	1	1	1	1	1	0	1	2	0	1	0	2	2	1	0	1	0	0	0	0	0	2	1	2	1
<i>S. setulosus</i>	1	1	1	1	1	1	0	1	2	0	1	0	2	1	0	0	0	1	0	0	0	2	1	0	1
<i>S. hispanus</i>	1	1	1	0	2	1	0	1	2	0	1	0	2	1	0	0	1	1	0	0	0	2	1	2	1
<i>S. arachnoides</i>	0	0	1	2	1	0	1	2	0	1	0	1	2	0	0	1	1	1	1	0	2	2	1	2	1
<i>S. slaoui</i>	1	0	1	0	1	1	0	1	2	0	1	0	2	2	0	0	1	1	1	1	0	2	2	0	2
<i>S. comosellus</i>	1	0	1	0	2	1	1	0	3	1	1	1	2	2	0	2	1	1	0	0	0	0	0	1	2
<i>S. espadaleri</i>	1	0	1	1	2	1	1	1	2	1	1	0	2	2	0	2	1	0	1	0	0	2	1	1	2

*Sternocoelis* formerly consists of an array of species defined on the basis of differences in punctation and setal density. Both characters were found to be highly variable.

There are several characters which are constant at the species level: general morphology of body, sides of pronotum, elytral striae, prosternum, mesosternum, metasternum and legs. Moreover male genitalia are very constant, with an almost imperceptible intraspecific variability.

Cladistic analysis of the 26 species of *Sternocoelis* was performed using HENNIG'86 (FARRIS, 1988). Twenty-five multistate characters were used for 26 taxa. The relatively low number of characters is due in part to the morphological uniformity of the genitalia.

The taxa were examined to determine the states of the characters from table 1 to construct the matrix (table 2). The hypothesis on character state polarity are listed in table 1 and are based upon a comparison with the chosen outgroup, the west Palaearctic *Hetaerius*.



TABLE 3

The most parsimonious cladogram by the Hennig'86 program from the character matrix included in table 2.



The characters are treated as additive. characters 22 and 23 are weighted three times and 5 and 6 are weighted twice the other characters. Character 22 (meso-metasternal excavation) separate *Hetaerius* and *Sternocoelis*, with a distinct progression among *Sternocoelis* species. Character 23 (lateral mesosternal foveae) show three well-defined morphological types. Character 5 (shape of pronotum) and 6 (sides of

TABLE 4

Geographical distribution of *Sternocoelis* (P = Portugal; GB = Gibraltar; SP = Spain; M = Morocco; A = Algeria; TN = Tunisia; CO = Corsica; SA = Sardinia; SI = Sicily; GR = Greece; B = Bulgaria; TU = Turkey; CY = Cyprus; J = Jordan).

	P	GB	SP	M	A	TN	CO	SA	SI	GR	B	TU	CY	J
<i>S. viaticus</i>					X									
<i>S. marseullii</i>			X											
<i>S. vaucheri</i>				X										
<i>S. lewisi</i>										X				
<i>S. diversepunctatus</i>													X	
<i>S. puberulus</i>							X	X	X					
<i>S. merkliei</i>										X	X	X		
<i>S. otini</i>				X										
<i>S. marginalis</i>						X								
<i>S. laevidorsis</i>					X	X								
<i>S. grandis</i>												X		X
<i>S. robustus</i>													X	
<i>S. fuscus</i>		X	X	X										
<i>S. incisus</i>			X											
<i>S. alluaudi</i>				X										
<i>S. acutangulus</i>		X	X	X										
<i>S. pluristriatus</i>					X									
<i>S. bedeli</i>					X									
<i>S. punctulatus</i>					X									
<i>S. atlantis</i>				X										
<i>S. setulosus</i>					X	X								
<i>S. hispanus</i>	X		X	X										
<i>S. arachnooides</i>			X	X										
<i>S. slaoui</i>				X										
<i>S. comosellus</i>					X									
<i>S. espadalevi</i>				X										

pronotum) also delimit several groups of species. These characters are more appraised because they delimit groups of species variably related with the outgroup. These characters are considered to be of superior phyletic weight by outgroup comparison (NEFF, 1986). It is assumed the hypothesis that those characters have more evolutionary significance by both general generic and outgroup appraisal.

The m\*; bb\*; option was used to produce 8 equally most-parsimonious trees of length 147 consistency index of 0.34 and retention index of 0.69. These trees mainly differed in the internal position of several species groups with similar branches. The Nelsen command was then used to obtain a consensus tree (strict) (FARRIS, 1988).

The tree presented (table 3) should be considered only as an approximation of the phylogeny of *Sternocoelis*, due to the low consistency resulting from the limited number of characters evaluated. Other analyses can be also carried out.

Plesiomorphic and apomorphic characters were widely distributed with few apomorphies defining species groups (table 3). One clearly monophyletic group as defined by the length of meso- and metatibiae includes *S. atlantis*, *S. setulosus*, *S.*

*hispanus*, *S. arachnoides*, *S. slaoui*, *S. comosellus*, *S. espadaleri*). Within this group, *arachnoides* and *slaoui* are sister species by virtue of lacking the inner lateral stria of metasternum. *S. comosellus* and *S. espadaleri* are also sister species by virtue of having widely and deeply emarginate prosternal lobe.

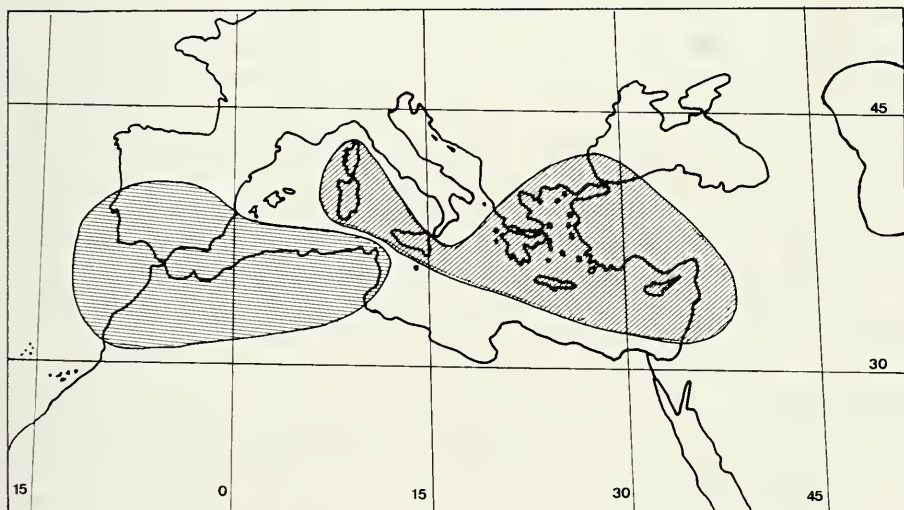
Several plesiomorphic characters occur in all *Sternocoelis*. A plesiotypic clade includes *S. viaticus*, *S. marseulii* and *S. vaucheri*, closely related to the outgroup.

Superposing the cladogram on the geographical distribution of species, two well defined centers of diversity (map 1) can be observed: The first is the Iberian-Maghrebian area including Portugal, Gibraltar, Spain, Morocco, Algeria and Tunisia in which are included the majority of species. The other area in the eastern Mediterranean with fewer species includes Corsica, Sardinia, Sicily, Greece, Bulgaria, Turkey, Cyprus and Jordan. A zone of contact exists for both groups via the Central Mediterranean region (Tunisia, Sicily and Greece). In general, the Iberian-Maghrebian species exhibit a greater frequency of apomorphic characters than the species from the other area. However the most plesiomorphic clade is found here as well.

It seems logical to postulate the origin of this genus in the region of Northern Africa in the vicinity of the Atlas mountains, dispersed from W to E. A dispersion from E to W could also be possible, with the origin in the eastern Mediterranean, but it does not agree with the closeness among the three Iberian-Maghrebian species (*viaticus*, *marseulii*, *vaucheri*) and the outgroup. Early this genus would have been

#### MAP I

Distribution of *Sternocoelis* in the Mediterranean area showing two areas (Iberian-Maghrebian and north-eastern).



distributed on the Mediterranean area. The geographical isolation would have confined several species on the central-oriental area, with low specific diversity, showing plesiomorphic characters. Later other species with apomorphies would have been generated, being dispersed on the Iberian-Maghrebian area, not reaching the central-oriental zone due to the new geographical framework. This area is inhabited by both plesiomorphic and apomorphic species and the highest species diversity (table 4). The species with the larger number of apomorphies do not occur in the north-oriental area.

Several instances of possible speciation by vicariance can be observed (CROIZAT *et al.*, 1974). Several groups which may have speciated allopatrically include: [*viaticus* (Algeria)- *marseullii* (Spain)- *vaucheri* (Morocco)], [*puberulus* (Sicily, Sardinia, Corsica)- *merklia* (Greece, Bulgaria, Turkey)], [*otini* (Morocco)- *marginalis* (Tunisia)], [*grandis* (Turkey, Jordan)- *robustus* (Cyprus)], [*diversepunctatus* (Cyprus)- *lewisi* (Greece)], [*atlantis* (Morocco)- *setulosus* (Algeria, Tunisia)- *hispanus* (Portugal, Spain, Morocco)] and [*comosellus* (Algeria)- *espadaleri* (Morocco)]. Groups which may have speciated sympatrically include: [*pluristriatus*- *bedeli* (Algeria)], [*arachnoides* (South Spain, North Morocco)- *slaoui* (North Morocco)].

According to the cladogram *Sternocoelis* is divided into two major monophyletic lineages. The plesiotypic *viaticus*-group and a much larger group composed of the remainder species. The larger group is subdivided into the following species groups: *S. merklia*-group, six species; *S. otini*-group, three species; and the *S. fuscus*-group fourteen species.

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